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CONGENITAL AUDITORY IMPERCEPTION (CONGENITAL WORD-DEAFNESS): WITH REPORT OF A CASE.*

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INTRODUCTION.

Cases of ' word-deafness ' that can be regarded as congenital are of considerable rarity. Owing to the disorganisation of speech-mechanisms that inevitably results from this auditory defect and which constitutes the most striking clinical feature, many such cases in the past have been misinterpreted and described in terms of the speech disorder or of a supposed mental defect, without any indication of the impairment in the field of auditory perception. There has, indeed, been no general agreement among writers as to the most suitable term to apply to the condition.

In the case described the outstanding defect is the inability to appreciate the significance of spoken words ; but, in addition, there is also considerable inability to distinguish between less specialised sounds. It would appear that the term ' word-deafness ' is too limited in scope to apply to this case, while the same may be said of the terms ' word-sound-deafness ' and ' word-meaning-deafness.' On the other hand, the term ' congenital auditory agnosia ' has too broad a significance, as implying a total lack of ability to differentiate between any sounds whatever. The term 'congenital auditory imperception' is free from these objections and probably describes the fundamental defect more completely. The only difficulty in the use of this term is that ' word-deafness ' has been sanctioned by usage in adult cases and will probably on this account continue to be used in congenital cases. The application of ' congenital word-deafness ' to these cases is only justifiable as long as it is remembered that more than the mere auditory appreciation of words is defective, that the defect in perception may extend to other less specialised sounds, and that the term is used in a general sense only.

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The present communication is confined solely to a description of the clinical features of a case of congenital auditory imperception based upon routine methods of examination, together with a discussion on the nature of the primary defect present. It is hoped in later communications to deal with the results of more specialised methods of examination; also, to review and discuss the subject, especially the exact relationship of so-called congenital word-deafness to speech defects such as 'idioglossia.'

PERSONAL CASE.

T.T., male, age 12 years, was brought to hospital on March 24, 1928, for investigation because his speech had always been imperfect.

History of present condition.—He was a full-term child; instruments were used at the confinement but there was no definite evidence of injury to the child during birth; the mother had much vomiting during labour and died 12 hours after the confinement. Up to the age of 13 months the boy was in the charge of his grandmother and after that of his mother's sister, who then became his stepmother.

He was always a very healthy child and rather forward in many ways. He invariably had a peculiar cry—low and moaning—quite unlike that of other children of his age. He sat up at four months; cut his first tooth about ten months; walked at ten months, and could run at eleven months. He did not, however, attempt to say words at the usual time. His grandmother tried to teach him to talk by getting him to *repeat* sounds and words after her; he could do this at ten months but never made any attempt to say words of his own accord; consequently, by the time he went back to his own home at 13 months he had never said anything spontaneously.

In infancy he took notice of all that went on about him at the usual time. From the age of three months onwards it was observed that if he was spoken to he took no notice. At four months, when he was able to sit up in his perambulator, he never took any interest in, or smiled in response to, people who spoke to him but pushed them aside to see horses and vehicles go by. His interest in things he could *see* was always unusually acute.

At 14 months he would make a noise to indicate to his stepmother that he wanted her to do something or to attract her attention. At two years he learned to say "Cock-a-doodle-doo"; he was probably induced to do so on each occasion by shouting it in his ear. About three years he would say his name, but only after someone had said it in his hearing. At three years he had a fall on the left side of the head; following this he had a discharge of a watery fluid and a little blood from the left ear but it rapidly cleared up. At three years he had shown no evidence of association between sounds and objects, when suddenly it was noticed that he went to the door if he heard his father coming. After this he continued to look for his father if he heard a sound at the door. About this time, he learned to say his prayers by repeating them word for word after his stepmother; but he never at any time attempted to say them himself. He was always amused and laughed when he attempted to say the word "simplicity."

Before the age of five years he was sent to a Deaf and Dumb School at Margate, where he remained six months, and was taught to repeat the names of a few objects. He was taken away because he was surrounded by children who did not talk and his parents thought that he would be better in the company of children who could talk. He was able to say "Mummy" and "Daddy" before going to this school, and after he returned he was able to say "run" and "jump."

At three years and again at five years he had an operation for the removal of adenoids. He then went to a day-school and picked up some words from other boys. At nine years he called boys "Jack" and "Jim"—the appropriate names; he also called his parents

" fools " when they did not please him, at which they were delighted, as the expression was used in the right sense and as it seemed on an appropriate occasion. He stayed at school until six months ago.

The following history was obtained from the stepmother, a very intelligent woman. The boy did not understand what was spoken to him. He was taught to say some words by a teacher who was a friend of the family. The teacher would get him to watch her, say such a sentence as " Take an apple off a dish and eat it," and then carry out the action herself. After constant repetition he understood if he watched what the command meant and would carry it out himself.

He could read words like " dog," " cat," " hen," " pig," " bat," " there," " this," " Mummy " and " Daddy." He could also associate the word read with the animal or object; e.g., if he saw the word " dog " he would point to the animal if one were near. He was taught to read at the Deaf and Dumb school, and can read simple and elementary words, but does not like doing so. If a word is said in his hearing, " his mind appears to get hold of the one idea " and he repeats the word constantly. He has not been tried often with printed or written words.

He can now speak spontaneously; he talks a great deal at times and is readily understood by those who are accustomed to him. Sometimes he cannot be understood at all. He mispronounces words; e.g., he says " note " for " coat "; his parents are in the habit of withholding the coat until he pronounces the word properly; after several attempts he gives the correct pronunciation. His stepmother is not certain whether he knows that he makes the mistake. He mixes words with signs and gestures and so expresses himself. He can speak a whole sentence such as " Mummy's gone out " quite normally, but it is rarely that he does anything as well as this. He has some " speech " and definite " words " now, but it is uncertain if there is any grammatical sequence. In speaking, he produces a number of sounds, some of them words readily understood, and other sounds which mean nothing to those who are listening to him. He can repeat:—

" Three blind mice,
See how they run,
They all run after——"

and that is as far as ever he gets. He can sing " doh," " re," " me," " fa "; his stepmother says he does it correctly only if someone does it with him. He cannot sing a song or air. If someone strikes a series of notes on the piano, e.g., a few syncopated notes and then a run, in his hearing and out of his sight, he can at once reproduce the same general idea—syncopation followed by a run but not necessarily the same notes. He can name some objects, but only those with which he is acquainted and whose names have been taught him; e.g., he called primroses " flowers." He has said the days of the week in order and correctly, but he does not seem to finish off the words properly. If told that he is wrong in the pronunciation of the word (it is doubtful if this is not where he can see the expression and movements associated with the remark), he at once replies: " It does not matter." He can name " Daddy " and " Mummy." Until the last two years, if he wanted " Daddy " and his mother came first, he would call her " Daddy "; and the same mistake was made if the positions were reversed.

He writes very well and is fond of writing down his own name, " Mummy," and " Daddy," but sometimes makes errors in writing and transposes letters. He wrote " JCAK " for " JACK," and " GGG " for " EGG." In the latter case, he knew that " GGG " was wrong when he read it, and changed it to " GEG." On being shown that the " E " came first he wrote " EGG." He has also written " HISH " for " FISH." He can sign his name, and prints and writes long hand.

He can read aloud a series of short words, e.g., " The cat sat on the mat." He reads to himself, but will read aloud if made to do so; usually, he is persuaded to do so by

showing him a penny. It is not possible to get him to read by telling him to do so, though it would be quite evident that he heard. He may understand a simple sentence such as the above when he is accustomed to it, but not more difficult ones. His stepmother says: "He does not appreciate words." It is not known whether he can understand printed or written commands.

He can copy printed words and printed letters. It is not known whether he can write to dictation; it is probable that he cannot do so. When a direction to do something was written on a blackboard, he did not carry out the command but simply wrote down word for word and letter for letter the command itself.

If a word is spoken in his hearing he can and will repeat it. He always likes to see the movements of the lips of those who are speaking to him. When words are spoken to him in the dark, he can repeat them. He hears the wind and is afraid to go to bed on account of it. He cannot actually tell the time, but he knows "school time," ".dinner time," and "bed time."

If a number of objects are placed before him, he can pick out one if its name is spoken but only if he is acquainted with the name and the object as a result of teaching (? by lip-reading). He would not be able to pick out the object if its name were spoken where he could not see the movements of the lips; and he might not understand it if it were printed or written. He can understand gestures and imitate them. If anyone does anything strange, he is apt to imitate him if he sees him doing it. He can pick out objects in a picture and tell about the picture "in his own way." He can convey to those who are used to him an idea of what the objects mean. He can draw from memory. When asked by signs and gestures to draw what he had seen during a visit to a natural history museum, he was able to draw a fish and a skeleton. If he knows what is wanted he can draw it from memory.

He is good at playing such games as football, cricket, cards, whist, draughts and ping-pong. He can play all card games and is rather good at them. He can do mechanical puzzles and puts together a Meccano set, takes it to pieces and puts it up again.

Previous Health.—There is no history of any illness before he cut his teeth. At eight months old he fell out of a high chair. At three years old he struck the left side of his head on a stone. At six years he had chickenpox and at ten years whooping-cough.

Family History.—He is the only child; his mother died twelve hours after he was born. His father was 26 and his mother 33 at the time of his birth. There were no miscarriages. His father married his mother's sister thirteen months later; of this marriage there are no children, and there have been no pregnancies. The father is the second in a family of nine, the fourth, fifth and sixth of which died young, one of diphtheria. There is no history of syphilis in the father of this family. The mother was ninth and the step-mother seventh in a family of eleven, the eldest of which died at birth, the second at six years and the eleventh at one month. The third in this family—a female—suffers from "nerve deafness" which began in adult life, while two others—one male and one female—were very slow in learning to speak.

General Condition and Central Nervous System.—He is a bright, intelligent boy and interested in all that goes on about him. His general behaviour is excellent. He plays and enjoys himself with other boys as a normal boy of his age.

The pupils are moderately dilated and react normally; vision is good in both eyes; the visual fields are normal; the optic discs and fundi are normal. No nystagmus. Speech and hearing are dealt with separately. The other cranial nerves are normal.

Sensation is normal. Upper limbs: motor power and tone are normal and equal on the two sides; the tendon reflexes are difficult to elicit, but are equal on the two sides. Lower limbs: motor power and tone are normal and equal; the knee jerks and ankle jerks are present and equal; no ankle clonus; and both plantar reflexes result in plantar

flexion. The abdominal reflexes are brisk and equal on the two sides. The gait is normal. There are no spontaneous movements; coordination in the upper limbs is normal; no Rombergism. Sphincters: there is occasional nocturnal enuresis.

All the other systems are normal. The pulse-rate averages 80; the blood pressure is 110 systolic and 65 diastolic. The Wassermann reaction in the blood is negative. Skull: there is no abnormality to palpation and X-ray examination reveals no abnormalities.

Examination of the Ears.—Right and left external ears normal. Membrana tympani both sides normal. There is a small white area on the right membrana tympani which might be an old scar. Bone conduction to the tuning fork test is normal in both ears. Air conduction is more prolonged than bone conduction. He can hear low- and high-pitched sounds equally well. Vestibular reactions normal. Rotation tests: rotation to the left results in nystagmus on looking to the right; rotation to the right results in nystagmus on looking to the left.

We are indebted to Sir James Dundas-Grant and Mr. Lionel Colledge for their aural reports.

Investigation of Speech, etc.—1. He does not understand what is said to him. When asked, "What is your name?" from a position in which he cannot see the face or the lips moving, he turns in the direction of the voice but makes no attempt whatever to reply to the question. Commands such as, "Give me your hand," "Open your mouth," "Shut your eyes," from the same position result only in a turning of the head in the direction of the sound. When from a position in which he can see the face and the lips moving, he is asked, "What is your name?" he replies correctly at once, "Tommy Toft." Subsequently, asking him his name and directing him to perform certain actions with the above commands result in his making a series of sounds which have no resemblance to words or syllables. The sounding of a tuning-fork close to his ear without his seeing it results in his saying a word which resembles "tong." Directions to write his name, or to name the days of the week from a position in which he cannot see the examiner produce no result beyond the turning of the head in the direction of the voice.

2. When shown printed instructions—e.g., "Shut your eyes," "What is your name?"—he reads the command slowly from beginning to end, looks inquiringly about him, but makes no attempt to carry out the command.

3. Spontaneous speech: He is reported to have said spontaneously "I can bath myself this morning." His voice is low, thin, toneless and monotonous; there is no distinction or variation of tone in the syllables; the first part of a word is pronounced fairly well but the end of it fades away into a thin whine. He sometimes produces four or five words in order, but as a rule he rarely says more than two words at a time. He is obviously not aware of errors in what he says or in his pronunciation of words; having said his name or read a command aloud, he looks at one as if he expected appreciation of what he has said, and shows no anxiety if he has mispronounced, clipped or mistaken a word. As a rule, his 'speech' is confined to single words. He produces 'speech' and 'words' in the manner described above. The rare sentences he uses are grammatical, though the problems contained therein are perfectly simple. When an attempt is made to convey anything to him by lip-reading or by showing him a printed command, he sometimes responds with a jargon which has no resemblance to the formation of words or syllables. After seeing one say a word, he may repeat it four or five times. When shown "Three blind mice" on a paper, he repeats "Three blind mice, see how they run" and stops there; the words are sufficiently formed to indicate that he is repeating these words, but the last four could not be understood if one did not know that he was attempting to say them. Meanwhile he makes an obvious attempt to see what is printed on the paper.

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4. He can name objects, though often on account of his monotonous and asyllabic voice it is difficult to understand what he says. He calls a mirror, " mirror " ; a book, " book " ; a fountain pen, " pencil " ; and a pin " pin." Occasionally, he does not use the accepted word or name for an object, but employs a sound used constantly whenever that object is pointed out. When asked (by lip-reading) to say the days of the week in order, he utters a series of sounds which fade off but can be recognised as attempts at saying the names of the days in order. The beginning of each word can be recognised as the consonantal sound of S, M, T for Sunday, Monday, Tuesday ; but the rest of the word fades into a whining sound. In his expression of the word " Saturday," the " S " and the differentiation into three syllables can be distinguished. When asked to say the names of the months, he produces a series of sounds of one, two or three syllables which cannot be recognised as the names of the months ; occasionally, there is one which bears some resemblance to the accepted pronunciation, e.g., " January." He counts quite well from 1 to 30, but from " sixteen " onwards the " t " sound of each word is replaced by an " k " sound. When asked, " Who is at home ? " he repeats the question word for word, pauses for a long time, and then says, " Daddy," " Mummy," and " dog "—followed by a series of sounds which apparently represent words but cannot be understood as such. " Daddy " is expressed as a " d " sound followed by a sound trailing off, in which two syllables can be distinguished.

5. When asked (by seeing one speak) " Write your name," the results vary. When the materials are not quite prepared for him, he waits until they are arranged, stares about him and makes no attempt to carry out the instructions. When the question is repeated and everything is ready, he writes " WHEN." On again being told, " Write your name ; your name," he writes " MAN." When " your name " is repeated, he writes " TO MAN." When " Your name ; Tommy Toft " is spoken, he writes " TOMMY TOFT."

6. He can read aloud from an elementary school book quite well. He reads " Is the cow in the yard ? " slowly and with long pauses between the words. He reads single words which do not form a sentence much better and more quickly. He apparently understands what he reads. When shown the printed words " What is your name ? " he reads the sentence word by word aloud, but apparently does not understand the significance of what he has read and makes no attempt to reply. He has not been persuaded to repeat the substance of what he has read. In a picture he names " cow," " tree," " pig " and " cloud " when they are pointed out.

7. He can copy written and printed letters and words. When " CAT " is shown to him he prints " CAT " correctly. He does sums in arithmetic involving addition, subtraction and multiplication, and writes correctly the various stages in the different processes.

8. He cannot write to dictation when the speaker is out of his sight. When he can see the lips and face moving and " TOMMY TOFT " is dictated to him, he writes " TOMMY TOFT " correctly.

9. He repeats simple words, e.g., " dog," " cat," when spoken to him both from where he cannot and from where he can see. He also repeats a short sentence : " It is Monday."

10. He recognises and names the hours of a watch and can tell the time. When shown a watch and asked " What is the time ? " he answers correctly, " twenty to six." He does not set the hands of a watch correctly. When asked to set the hands at " four o'clock," he first sets them at " a quarter to six " and then at " ten past six."

11. He cannot pick out objects named when the name is spoken out of his sight. For a " pencil " he picks up a penny ; for a " pen," a sixpence ; and for a " penny," a florin. When the name is spoken where he can see the speaker, he picks out correctly a pen, a pencil, a sixpence, and a penny. When the names " penny," " sixpence," and " pencil "

are printed, he reads the name aloud and picks out each object correctly. He cannot pick out colours when the name is spoken out of his sight, but he does so correctly when he hears one speak.

12. He understands gestures quite well and imitates them.

13. He plays simple pieces on the piano. He plays simple pieces from the manuscript and makes some mistakes but does not show that he is in any way disturbed by discords. He plays a simple piece that he has often played before, both with his eyes open and with them covered. He makes mistakes, and again is not disturbed by discords. When a series of musical notes are sung out of his sight, he repeats the phrases used but does not sing the notes correctly. He is not in any way disturbed by his mistakes.

14. He hears and recognises the sound of a tuning-fork and indicates by signs that he knows what it is. Afterwards, an unmusical note made by hitting two pieces of metal together is described by him in signs as a tuning-fork.

15. Playing a card game—"Snap"—which depends upon the prompt recognition of the simultaneous appearance of cards of the same value, he recognises similarities very quickly and long before his opponent.

16. During the Oxford-Cambridge boat race he was persuaded to put on the ear-phones to listen to the account of it by wireless. He kept them on for one to two minutes, then took them off, threw them on the bed and went off to attend to something else. (His stepmother says that at home he is sometimes persuaded to put on ear-phones, but he will never listen for more than a minute or two.)

17. He said spontaneously to the boy next to him: "Have you a coat?"

18. In naming objects pointed out to him one by one, he names some correctly but for others uses a sound which is not recognisable as the name of the object. He has a sound which he employs for the name of such an object *each time it is pointed out.* In one case, he was directed: "Tuning-fork; pick it up," the object being pointed out at the same time. On five successive attempts, when it was pointed out and he was directed to name it, he said: "Pick it up" and did not realise his mistake. Finally, after it was named several times before him, he named it correctly: "Tuning-fork."

CLINICAL COMMENTARY.

The case is that of a boy of twelve who has had difficulty in learning to speak and, even now, is unable to make himself understood by those who are not accustomed to him. In spite of a somewhat difficult confinement, he showed no evidence of injury at birth and now exhibits no features which can definitely be ascribed to intracranial injury. He has developed normally, both physically and mentally, and on physical examination reveals no abnormalities other than the speech defect and the associated phenomena. As an infant, he used his limbs in the normal manner and as a boy indulged in the usual physical activities of a boy of his age. He showed early in life that he suffered from no defect of hearing or of the muscles of articulation, for it was observed by his grandmother, in whose care he was, that he could hear words and sounds and would attempt to repeat them after her.

Thus it was soon evident that there were no defects in the peripheral organs of hearing and sight, and still less in the muscles of articulation and expression. These observations are confirmed in every particular by the results of physical examination. As time went on, it was evident to his parents that he was normal in every way except for his speech defect; so much so, that at the age

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of five they were unwilling that he should remain at a school for the deaf and dumb " because he was not really deaf," and were able to sum up his disability in the words : " He does not appreciate words."

Since it was thus early apparent that his defect was in the field of reception, it is necessary to examine the evidence upon which this observation was based and to consider in the first place the deficiency associated with the reception and interpretation of sound.

During the first three months of his life it was noticed by his grandmother, who was experienced in the ways of infants, that he always had a peculiar, low and moaning cry quite unlike that of other children of his age, in spite of the fact that he was a perfectly healthy child and unusually advanced in other ways. In other words, he continued to use the monotonous, toneless cry of his first utterance induced at his birth as a pure reflex act from the assumption of the function of respiration and adjustment to environment, and he did not learn, as most infants of his age, to express the affective states of discomfort, pain, hunger and pleasure by different cries and sounds. At the age of four months, he failed to respond to variations in sound or speech in the usual way—a distinctly abnormal feature in a child of that age. Kahlmann[1] indicates that the average infant of three months should react to sudden sounds and to variations in sounds, and includes a test based upon this fact in his series of mental tests for infants of that age. Up to the age of three years there was no evidence of spontaneous speech, and none of memory for sounds and their association with objects, persons and affective states. Such words as he had said before that age were in the nature of parrot-like repetitions, and were induced in every case by constant repetition of particular words in his hearing. It is true that at the age of fourteen months he made a " peculiar sound " to draw the attention of his stepmother to him, but there was in this nothing in the nature of word- or even of syllable-formation. At the age of three he apparently associated a certain sound with the arrival of his father, but it is by no means certain that he did not associate his stepmother's expression with the event. At the age of five he was at a Deaf and Dumb school for a short period and from that age the clinical picture, in consequence, is complicated by the practice of lip-reading and the association of movements of the lips and changes in the facial expression with persons, objects and affective states. It is sufficiently clear, however, that from earliest infancy the child did not appreciate the nature and significance of sounds, and that his disability was not due in any way to impairment of hearing.

It was obvious at an early age that if there was any defect in the field of visual reception it was of a comparatively minor type. The boy took notice of all that went on about him at the usual time, and at the age of four months showed definite evidence not only of memory for visual impressions, but also of a decided preference for visual impressions as compared with auditory impressions. His interest in things he could see was always unusually acute,

and he recognised horses and vehicles easily at an early age. He also knew his father, stepmother and grandmother when he saw them. It is apparent, therefore, that there was no failure to recognise pictures even in infancy, though, as will be seen later, with the progress of his education certain minor defects in his memory for visual impressions were revealed.

The evidence arising from the history of the boy after he learned to lip-read is most conveniently considered together with the results of the detailed investigation of his receptive aphasia. From these it is evident that he never had any memory for word-sounds and that that for auditory impressions was also deficient. He simply repeated words as he heard them, and often repeated them many times but with no obvious appreciation of their meaning. There is no response whatever when he is told to repeat the words of a rhyme with which he is acquainted ; but he can repeat eleven words of it after he sees the examiner repeat the first three words a number of times. He does not understand at all what is said to him ; questions and commands spoken out of his sight result in no response other than a turning of the head in the direction of the voice, an attempt to see the lips of the person speaking, or a parrot-like repetition of the first word or two of the sentence. He cannot write from dictation when the speaker is out of his sight. He cannot pick out objects named when the name is spoken out of his sight, and invariably mistakes the object when, by other methods, he is made to understand what is required of him. He does not recognise mistakes in music ; is not disturbed by discords ; and fails to repeat correctly a number of musical notes sung in his hearing. He does not appreciate or even understand descriptions heard by listening in on a wireless set, but will listen to organ music with evident appreciation. He has, however, a certain memory for sounds of an uncomplicated nature ; he has an obvious sense of fear when he hears the noise of the wind at night, and he can recognise the sound of a tuning-fork though, in the latter case, he fails to recognise that a decidedly unmusical noise is different. Since physical examination shows that both middle and internal ears are perfectly normal, it is evident from the above that there is a complete absence of memory for words and musical tones. Because of the absence of this elemental feature essential to the normal development of speech, he failed to use words spontaneously and in their correct associations until he acquired the art of lip-reading at the age of five. Hence, while fully recognising the futility of endeavouring to place the different parts of the speech-mechanism in separate and clearly defined " centres " and accepting the complete interdependence of each speech-element, it is desirable, for the sake of simplicity in discussion, to use the term of the older nomenclature—centre—without implying the existence of a definite anatomical centre.

With an entire absence of a " word-memory centre," it is evident that, with the perfection of lip-reading, the boy would have to build up from his memories of lip movements and facial expressions and their association with

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persons, objects and affective states, a new " centre " for the memory of words which, for convenience in description, we propose to call the " lip-reading word-memory centre." That the habitual association of various impressions has resulted in a memory for words appreciated by lip-reading is evident from the history and examination of the patient ; and that it is as yet imperfectly developed and requires further development is obvious from certain defects and errors which will be referred to later. At the age of four the boy was able to say " Mummy " and " Daddy " to his parents, but was unable to associate the words with the correct individuals if they appeared to him in the wrong order. It was only after he had received instruction for a short time in the practice of lip-reading that he was able to acquire normal words for himself. Hence it is reasonable to suppose that he has developed his present " conventional " vocabulary by seeing and not by hearing others speak. As a rule, he answers questions, obeys commands, and appreciates affective states when he can see the movements of the speaker's lips and the expression of his face. He can name objects correctly when they are pointed out to him and he can understand directions by lip-reading. He can repeat the names of the days of the week and count from 1 to 30 when asked to do so in the same way. He can answer simple questions involving the use of only one word when directed to do so. He can pick out objects correctly when they are named where he can see the speaker. His success in these tests is certainly due to the fact that by habitual association he has built up a memory for words from seeing others speak. He is not, however, always so successful. At times, he does not respond at all, and at others he replies with a series of sounds which have no resemblance to words as others know them. His occasional failure to respond to commands is probably due to the imperfect development of his " lip-reading word-memory centre " ; while his use of jargon and strange sounds, his mispronunciation of numerals above 16 and his use of an unusual sound constantly for a definite object are probably expressions of so-called " idioglossia," a feature of his case which will be referred to at a later stage.

It is now generally recognised that all parts of the speech-mechanism function as a complex whole ; and it is obvious, therefore, that when one part is entirely absent or defective and that which is being produced to replace it is imperfectly developed, the remaining parts will exhibit defects which will vary with the training of the subject. In the patient under discussion, there is an entire absence of the " auditory word-memory centre," and an imperfectly developed " lip-reading word-memory centre." Hence it is only to be expected that some word-blindness and agraphia will be present in addition to the speech defect ; and this is what is found.

In spite of the fact that visual memory was apparently perfect in early childhood, the confusion of objects and symbols as the patient's education proceeded revealed some defects in his memory for visual impressions. That they are only minor defects is shown by the fact that he remembers faces,

recognises objects in pictures, recognises similarities and differences in playing-cards more readily than other boys of his age, reads and answers written questions, reads and obeys printed commands, draws sketches of what he has seen from memory, recognises concrete objects and animals, reads music and does elementary sums in arithmetic. That there are definite defects present is shown by his occasional difficulty in appreciating and carrying out simple printed commands, by his failure to recognise a mistake in the spelling of simple words with which he is well acquainted, and by his response to the written command " Write your name." Slight defects in writing are revealed in his persistent transposition of letters in the printing of simple words, though his failure to recognise and correct the mistake may have been due in part to his defect in visual word memory. The association paths between hearing and speaking are apparently normal, since he is able to repeat words parrot-like as they are spoken to him. There is also a certain lack of appreciation of the exact nature of the sounds he hears, as he occasionally repeats the words imperfectly and at times fails to repeat musical notes correctly though at other times he can do so. As far as can be determined from observation, all his other associations are normal provided that no stress is placed upon his " auditory word-memory centre," and as long as the stress placed upon his " visual word-memory centre " is not too great. There remains, for consideration, however, the speech defect and its effect upon the development of the intelligence and usefulness of the individual.

In learning to speak, the normal infant at first becomes preoccupied with the sounds he is producing as a result of certain affective states ; he practises them constantly and from time to time adds new sounds to his vocabulary and so brings them to perfection, partly with the help of his imitation of the sounds made by his elders in his hearing and partly by his own appreciation of the sounds he himself utters during his constant repetitions. Later, he associates definite sounds made by himself and others with certain objects and persons seen, felt, smelt, tasted and heard ; and, finally, knowing that he is capable of making sounds of different kinds he attempts to imitate his mother when he hears her use definite sounds in connection with definite objects. In this way he learns to speak. The patient under discussion revealed a defect in his speech mechanism in early infancy in the form of his cry, which was constantly the same and did not vary with the affective state giving rise to it. He made no attempt at all to practise sounds himself and at the age of 13 months had never said anything spontaneously. At the age of 14 months he made some attempt to develop a spontaneous language in the " strange sound " he made to attract the attention of others to him, but this sound did not resemble anything he had heard or the words others had tried to teach him. At the age of five his whole vocabulary consisted of the parrot-like repetition of " Cock-a-doodle-doo," his own name, "Mummy" and "Daddy." It is apparent, therefore, that up to this age he had relied entirely upon the repetition of sounds as he

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heard them for his language. Then a new factor—the influence of his knowledge of lip-reading—was introduced into the development of his language. Henceforth, he had three factors upon which to rely :—(1) his association of lip movements and facial expressions with objects, persons and affective states ; (2) his repetition of sounds as he heard them in association with objects, concrete and abstract, without any appreciation of their finer variations ; and (3) his imitation of the gestures of others in his attempts to express his meaning. It is evident that, to a child handicapped as he was and with only a very elementary education in lip-reading, these methods of expression would probably appeal in the inverse order to that in which they are mentioned above. Gestures he has always relied upon freely to express his meaning, and even now he uses them intelligently whenever he finds that he cannot make himself understood by other means. The influence of the other two factors will be readily understood from his subsequent history and from his present condition. He soon learned to use definite words, sometimes with startling appropriateness ; he has gradually developed a small vocabulary of normal words, and does at times, though rarely, use short sentences spontaneously. This is the limited extent to which he has developed his knowledge of " conventional language," probably entirely as a result of his education in lip-reading. He relies, chiefly, however, upon a series of expressions of his own. At times, asking him questions and directing him to perform certain actions result in his making a series of sounds which appear to have no resemblance to words or syllables ; but subsequent investigation of this apparent " jargon," word by word, reveals in it a structure which is constant for the sounds applied to definite objects. Minor degrees of this variation are apparent in his saying " note " for " coat " and in his replacement of " t " by " k " in the names of numerals over 16.

AN INDIVIDUAL LANGUAGE: IDIOGLOSSIA.

It is obvious, therefore, that he has *developed a language of his own* based partly upon his attempt to reproduce sounds exactly as he has heard others produce them, and partly upon his observation of the movements of lips and other structures by others when they are uttering words. That the latter is at least a minor factor in the production of his language is supported by the fact that when he meets a word with which he is apparently unfamiliar, he attempts to imitate step by step the movements and expression of the speaker before he actually produces his version of the word as a whole. His low, thin, monotonous voice and his apparent asyllabic sounds show, however, that he has built up a great deal of his language from constant imitation of the sounds produced by others but without any appreciation of their finer variations. This " individual " language of his, therefore, is almost certainly of the nature of " idioglossia." That it is true " individual " language and not a mere " jargon " is supported by three observations : (1) by constant observation its structure and meaning can be appreciated ; (2) those in constant contact

with him can understand easily what he means in spite of the queer sounds he produces ; and (3) other children understand readily what he means even at the time of their earliest association with him.

That there is a definite " idioglossia " of the type described by Bastian,[2] Guthrie,[3] and McCready[4] is supported by the following examples of his language. The letters of the alphabet are consistently named by him in order : " aiee, bee, hos, aiee, bee, eff, tea, gee, aiee, fum, to, orl, yem, ko, oo, pee, ker, puf, ess and ets, tum, uu, vets, wee or weet, dumu, whale, wez " ; the numerals from 1 to 30 are named : " wun, tu, tumee, fuore, fief, tiksch, teven, aitt, nocee, teee, lefer, twefee, doka, fuukee, fifikee, tuku, tiviku, aaku, numku, twerku, wikawun, wikatrue, wikatume, wikafuor, wikafife, wikakik, wikakeven, wika-aak, wikanee, tukee"; the tens are called : " teee, twerku, tukee, fuokee, fifikee, tikee, kiwikee, atkee, nikee" ; one hundred is called "agu-agu"; and one thousand "agu-oo." Examples of the names used for common objects are : " tikipu " for sixpence ; " tu kwivee kik " for two and sixpence ; " kepu " for spoon ; " toto " for tie ; " nops " for nose ; " peku " for pen ; " pickapok " for pocket ; and " toof " for coat. It is interesting to note that when these words of his " individual " language are used as he says them, he fails to understand their meaning ; but recognises quite readily the corresponding " conventional " words when they are used in their place. The naming of the letters of the alphabet agrees in some respects with that in six cases of " idioglossia " mentioned by Guthrie[3], including those of Hale-White and Golding Bird[5], Taylor[6], and Hadden[7] ; but in many cases the terms employed are peculiar to the individual. The exact relationship of " idioglossia " to congenital auditory imperception, we hope to discuss in a further communication.

The subject of this communication is at least of average intelligence, which confirms the opinion expressed by McCready[4] that a high degree of congenital " aphasia " is not incompatible with normal or even superior intelligence. Bronner[8] has pointed out that, in such cases, a definite relationship may exist between the " aphasia," abnormal behaviour, and unusual emotional reactions. In our patient the emotional reactions are perfectly normal and his behaviour is all that could be desired, probably because there is in him and his family no inherent tendency to emotional instability. Regarding the psychological reactions to the disability mentioned by Orton[9], there is no suggestion of any thing that might lead to asocial behaviour, an observation which is of some importance in view of the reputed association of the handicap with delinquency in children. On the whole, the boy shows a contented, apathetic disregard of the handicap and its results ; he is perfectly happy in his life as it is ; but when the prospect of earning a living in adult life is forced upon his attention, he exhibits a slight sense of inferiority in his reply that he will never be able to do so as he cannot speak. This sense of inferiority is, however, of a very slight degree and not sufficiently prominent to affect his behaviour and his relationships with his teachers and his fellows.

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ETIOLOGY.

It is interesting to speculate upon the pathological cause of the condition in the patient described. There are two possible primary factors to be considered, viz., (1) the effect of a birth injury in the production of an intracranial hæmorrhage with consequent damage to structures in the temporal lobes of importance in the development of the speech mechanism ; (2) the presence of a biological variation comparable with colour-blindness. It is difficult after twelve years to decide if a minor intracranial injury has been present or not : but at least this case exhibits no physical or mental abnormalities which could be ascribed to injury at birth. It is true that there was every chance that some such injury might have occurred, for the confinement was unusually severe, instruments were used, and the mother died twelve hours later. The various minor injuries to the head which the boy suffered from the age of eight months onward, and the development of adenoids, can, we consider, be ruled out as factors in the production of the condition simply on the knowledge that definite speech defects were present many months before. The determination of a possible biological variation or stigma of degeneration as the important factor is more difficult. It is true that at present a tendency exists to ascribe " spastic diplegia " (Little's disease) and other conditions of the same type to cerebral aplasia rather than to the effects of intracranial hæmorrhage at birth, but in the consideration of a particular case all possible factors must be carefully considered before any conclusion can be reached. The strongest and only argument in favour of a biological variation in the present case is the fact that the defect is of a familial character. There is no defect whatever on the father's side or in his family ; but there is definite evidence of difficulty in learning to speak in members of the mother's family. The mother of the subject was perfectly normal in her acquisition of speech, but in her family of eleven brothers and sisters there were three others in whom there was difficulty in learning to speak or in the appreciation of sounds. One sister of the mother, now the subject's step-mother, spoke first at the age of four and not at all distinctly until she was ten, although she was able to read easily long before she was that age ; another sister is reputed to suffer from " nerve deafness " ; while a brother was a little backward in speaking and at the age of three could not pronounce most of his words well enough to be understood. Careful investigation of the previous generation on both the grandfather's and grandmother's side fails to reveal any defect of speech or " hearing." Thus there is definite evidence of the presence of a familial factor in the etiology of the condition, an influence also noted in cases of " congenital word blindness " by Thomas[10], Fisher[11], Stephenson[12], Hinshelwood[13], Plate[14], McCready[4], and in idioglossia by Hadden[7], Hale-White[5], and Taylor[6]. In our patient, like that of Stephenson's, the defect is apparently transmitted through a healthy female to her male offspring, though in the latter case it was noted that the transmission from a previous generation was through an affected female.

Whether the familial defect is of the nature of a simple biological variation or of a local aplasia affecting those parts of the brain concerned with the reception and association of sounds it is difficult to determine. A secondary factor—loss of the stimulation and encouragement of the child's own mother—may have played some part in the perpetuation of the defect, but it could not have had any influence upon the actual production of the defect. Other children in a like situation do not show defects in the appreciation of sound and in the development of speech, though it is true that if exposed to an environment in which stimulation and encouragement are absent, they may not progress as rapidly as other children. The influence of adenoids, from which the subject suffered and for which he had two operations, can be excluded as an important factor, for, as Guthrie points out, in spite of the fact that they may produce defective utterance they cannot alone account for idioglossia. Hence it may be concluded that in this case the balance of evidence is in favour of the influence of a biological variation of unknown nature and origin as the important factor in the causation of the defect. The influence of birth injury cannot, however, be absolutely excluded.

SUMMARY.

1. A case is described which is regarded as one of " congenital auditory imperception " ; complete word-deafness, or more strictly, word-meaning-deafness, is the most important element, but there is some degree of auditory agnosia. Slight word-blindness, slight agraphia or dysgraphia, and a pronounced speech defect are associated secondary elements.

2. The disorganisation of the speech-mechanism has led to the development, in the patient concerned, of a method of expression which is of the nature of so-called " idioglossia "—an " individual language " representing an extreme form of mispronounced and ill-expressed conventional language.

3. The case illustrates the interdependence of each and every elemental part of the speech-mechanism and especially the dependence of normal speech development upon the appreciation of variations in sounds. The observations carried out tend to confirm the modern view that the speech-mechanism cannot be divided into clearly defined " centres," but must be regarded as a physiological mechanism which functions as a complete whole.

4. As regards the causation of the disorder, the balance of evidence is in favour of a biological variation or of local aplasia, but birth injury cannot be definitely excluded.

5. The case raises important questions such as the influence of congenital " word-deafness " upon the development of speech defects such as " idioglossia," the influence of such a defect upon the development of general intelligence, the psychological reactions involved in those affected with such disability, their influence on behaviour and delinquency, and the importance of applying special methods of education to such cases in order to enable the individual to attain a self-supporting economic position and to prevent the development of antisocial tendencies.

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MICROGLIA: AN EXPERIMENTAL STUDY IN RABBITS AFTER INTRACEREBRAL INJECTION OF BLOOD.

By E. ARNOLD CARMICHAEL, London.

INTRODUCTION.

Till within recent years knowledge of the interstitial cells in the central nervous system has advanced but slowly. Cajal divided the elements of the nervous system into three groups—nerve-cells, neuroglia, and adendritic corpuscles; his gold-sublimate method of impregnation[1] resulted in the demonstration of an almost complete picture of neuroglia and of the morphology of the protoplasmic and fibrous neuroglia. In 1919 Del Rio-Hortega[3] first published his preliminary work upon adendritic corpuscles, in which he described the processes of these cells as shown after impregnation with silver; with the silver method he was able to distinguish two types of cells, the oligodendroglia and the microglia. Further, he[2] brought forward considerable evidence for the mesodermal origin of the microglial cells and for their phagocytic properties. Though many workers have since agreed that compound granular corpuscles probably originate from microglial cells, it was for Pruijs[6] to suggest that oligodendroglia may function as compound granular corpuscles. Still more recently Struwe[5] has drawn attention to the presence of fat within astrocytes in pathological conditions. The function of supporting the brain structure also has been attributed to microglial cells by Schaffer[9], but Reynolds and Slater[8] believe they are chiefly concerned in the phagocytosis of particles of cerebral tissue. Jimenez di Asua[4] was the first to bring forward evidence that microglial cells are part of the reticulo-endothelial system, though Raminez Corria[7] had previously suggested such a relationship; the former worker, on comparing the microscopic appearance of the cells in the spleen and kidney (after silver impregnation) with microglial cells found considerable similarity between macrophage cells and microglial cells; failure, however, to stain the latter after intravenous injection of collargol and iron saccharate was explained on the basis that the cerebral vessels were impermeable to such substances.

The following work was undertaken to determine the rôle played by microglia and astrocytes in the removal of red blood corpuscles from brain tissue, as no literature upon the subject could be traced.

TECHNIQUE.

One half cubic centimetre of blood withdrawn from a rabbit's marginal ear vein was injected into the brain substance of the same rabbit under ether anæsthesia. In all, fifteen rabbits were so treated; these were killed with chloroform or ether at the following intervals after injection, viz., 1, 2, 3, 4, 5, 6, 7, 8, 12, 15 or 22 days. Four other rabbits were killed on the third, fifth, eighth and fifteenth days. Immediately the animal was dead the head was

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perfused with normal saline through either both carotids or the arch of aorta. After thorough perfusion formol bromide was allowed to run throu for ten to twenty minutes to ensure fixation. The brain was then remove cut into thin slabs and placed in a sufficiency of formol bromide in an incubat at 37° C. for 48 hours. To obtain good sections of microglial cells an acid solution of formol bromide was found best, being made up as follows :—

Ammonium bromide	2 grm.
Formaldehyde (35—40 per cent.) ..	15 c.c.
Doubly distilled water	85 c.c.

Immediately previous to their being cut on a freezing microtome, the appropriate slabs of brain tissue were placed in fresh formol bromide for ten minutes in a paraffin oven at 50°C. Sections were then cut at 15 to 20 micra and placed in 25 c.c. of doubly distilled water, containing four drops of strong ammonia, for twenty minutes. After a very rapid wash in doubly distilled water the sections were placed in the silver bath in the incubator at 37° C. till they turned the faintest brown. The silver bath was made as follows : to 5 c.c. of a 10 per cent. solution of silver nitrate were added 15 c.c. of a 5 per cent. solution of pure sodium carbonate ; the precipitate was then re-dissolved by the addition of a few drops of strong ammonia and the resultant clear solution diluted to 75 c.c. with doubly distilled water. It is essential not to add too much ammonia ; the solution should be practically odourless. After the silver bath, sections were very rapidly washed in doubly distilled water and then placed in 10 per cent. formalin. They were then toned in gold chloride until blue-grey, fixed in 5 per cent. sodium hyposulphite, cleared and mounted in Canada balsam.

Many modifications of this method were tried, but this gave the most satisfactory and uniform results.

It was found that pure chemicals, doubly distilled water and chemically clean glassware were essential in order to obtain constant results. Several sections after impregnation were stained for fat with Scharlach R. Fresh sections were also impregnated by Cajal's gold sublimate method for protoplasmic astrocytes, while fourteen days later further sections were impregnated by the same method for fibrillary astrocytes.

MICROGLIAL AND ASTROCYTIC REACTION.

The normal microglial cell has an angulated or rod-shaped nucleus with very little protoplasm surrounding it ; passing out from the cell-body are fine processes which frequently branch and radiate in all directions. Microglial cells arrange themselves in proximity to the cells of the cerebral nuclei ; others lie along blood vessels, still others in the midst of the cerebral tissue or along the tracts of the brain substance. These cells with their processes are made visible only with special silver impregnation methods.

At the end of the first 24 hours following the injection of blood definite anges in the character and distribution of microglial cells were observed. In ıe vicinity of the mass of injected blood their number was in excess of normal. 'he nuclei were altered to an oval shape and were larger than in normal microglia. In no section had the nucleus become spherical. The protoplasm surrounding the nucleus was increased in amount and in more than one cell evidence of vacuolation was observed. The processes were shorter and fatter (Fig. 1), and a careful study of them furnished interesting facts. The first

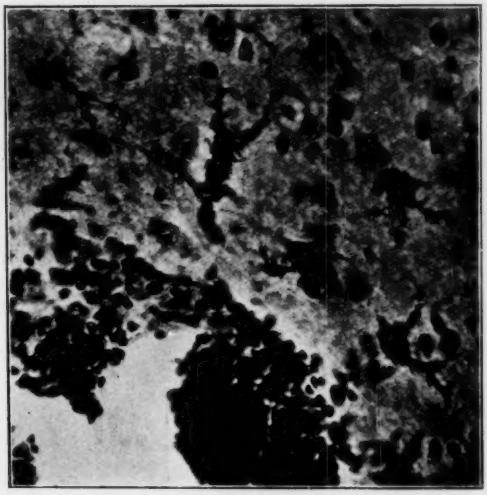

FIG. 1.

apparent alteration in the process was a swelling of its substance, so that the usual fine wire appearance was replaced by that of a ribbon ; but passing out from the edges were small irregular processes giving a ragged outline to each process. The shorter the processes the more regular was their outline. The substance of each process at this stage was fairly granular, with an occasional small clear area suggestive of a vacuole. Those cells in closest proximity to the foreign blood were almost globular, without any processes. These changes were assumed to indicate a withdrawal of the processes from the surrounding tissue towards the cell.

In two sections interesting phenomena were seen. At one place a few of the red corpuscles had become separated from the main mass of the blood and were lying loose in the cerebral tissue (Fig. 2). In this region microglial cells were seen with swollen processes ; lying between the processes individual blood

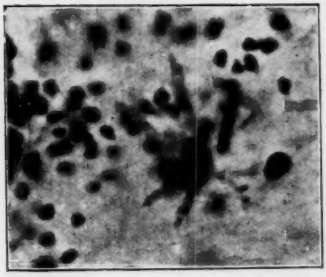

FIG. 2.

corpuscles were found. The appearance suggested that the microglial cell was about to engulf the blood corpuscles. Evidence of such a possible function of the microglia was only discovered in one instance after a prolonged search; in this case a red blood corpuscle was lying within the substance of a microglial cell (Fig. 3).

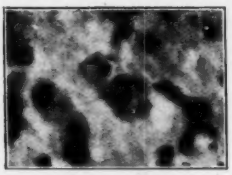

FIG. 3.

In sections stained with Scharlach R the microglial cells surrounding the mass of blood were found to contain multiple fat globules; whilst those at a distance, showing only some swelling of the processes, were devoid of any fat globules. The origin of the fat will be considered later.

In order to determine how soon changes in the microglial cells might be observed, three rabbits were anæsthetised and their brains incised with a sharp scalpel. These animals were killed 6 hours, 12 hours and 18 hours after the operation. At the end of 6 hours changes in the shape of the microglia along the edge of the wound had taken place: this was quite evident at the end of 12 and still more so at the end of 18 hours. It is therefore apparent that microglia reacts to trauma very rapidly and that microscopic evidence of early changes may be found at the end of 6 hours.

Coinciding with the changes in the microglial cells the astrocytes were also altered. In a zone surrounding the mass of blood, very poor impregnation of the astrocytes was obtained; the processes and cells appeared to have been completely broken up, leaving a debris of small granules of irregular shape and

size. Outside this zone the astrocytes showed swelling of their processes and their intracellular fibrils were barely distinguishable ; the cell body was enlarged and the nucleus ill-defined. Surrounding these two zones which merged into each other the astrocytes appeared quite healthy.

Sections from the rabbits killed on the second and third days after injection of the blood showed a progressive increase in the numbers of microglial cells in the vicinity of the blood (Fig. 4). All forms, up to the swollen microglial

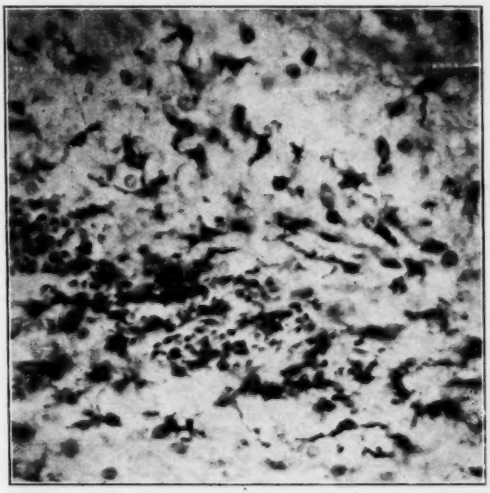

Fig. 4.

cell, were found. The origin of these new cells was sought and the presence of two or three microglial cells near the bifurcation of many capillary vessels appeared to offer a solution. At no place was the actual migration of a cell from within the blood vessel or from its lining to be seen. In the many sections examined only one mitotic figure was found ; no amitosis was observed. It appears therefore that the increase in number of microglial cells is due to their migration from neighbouring blood vessels and not to their multiplication by fission in the immediate vicinity.

Four days after the injection, the microglial cells were still increasing in number. New cells now made their appearance. These cells were large, with an oval pale staining nucleus ; they were not numerous and were scattered evenly in the tissue round the foreign blood. A close scrutiny of many sections failed to provide evidence as to their origin. Histologically they appeared to be large macrophage cells, closely resembling those derived from the reticulo-endothelial system. Sections stained with Scharlach R revealed microglial

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cells, crowded with fat globules, around the blood. At this stage there appeared little alteration in the character of the injected blood ; the red corpuscles still remained intact and stained well with eosin. It seems possible therefore that the microglial cells may have derived their fat globules from damaged brain tissue rather than from breaking-down blood corpuscles.

By the seventh day the maximum increase of microglial cells had taken place, for on the following and succeeding days they were fewer in number. Though the latter had ceased to increase, changes in the astrocytes were observed. On the fifth day following the injection of blood these cells were altered at the periphery of the damaged area. The zone containing swollen astrocytes was still present, but outside it they were dividing, as shown by the presence of several amitotic figures. Further, processes were seen extending from the cells in this region towards the mass of blood. On succeeding days the astrocytes of this zone were increased in number and the processes extending towards the region of the blood were very numerous. By the twelfth day they had walled off the damaged area ; the cells involved in this were large, with a fair amount of perinuclear protoplasm and with very thick processes.

Difficulty was encountered when an estimate of the fate of the injected red blood corpuscles was attempted, as it was impossible to be certain that sections from each rabbit were strictly comparable. No apparent diminution of the number of red blood cells was noticed up till the fifth day. From then onwards they were found to be decreasing in numbers. Sections from the rabbit killed on the eighth day showed only a few whole red blood corpuscles, while in sections from the rabbit killed on the twelfth day they were entirely absent. At this stage the region of the wound was occupied by large cells having an oval, deeply staining nucleus ; in the protoplasm of these cells fine highly refractile crystals were scattered (Fig. 5). These crystals were yellowish

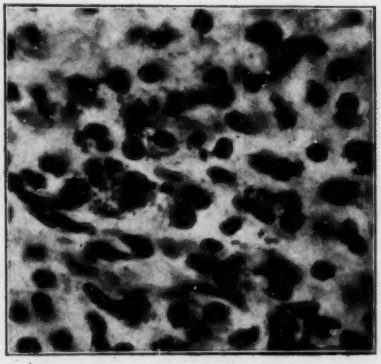

Fig. 5.

in colour and were similar to those found in nerve cells following intracerebral hæmorrhage. They were, therefore, taken to be end-products of red blood corpuscles. The cells which contained pigment were in many respects similar to globular forms of microglia, as the nuclei were of the same shape, size and staining properties. They differed from the large macrophage cell in that the nucleus was more deeply stained. Along with the appearance of these cells containing crystals new vessel-formation was noticed in the centre of the wound ; at first consisting of only a few capillaries, by the fifteenth day the vessel-formation was more definite and a venous channel with some perivascular fibrous tissue was present.

On the twenty-second day few microglial cells were found in the wound ; round it the microglia was of the normal resting type. The astrocytes in the same region were still large, with thick processes passing down to the central vessel ; the debris of the damaged astrocytes had been removed. In the wound a few cells containing crystals were found, and in sections stained by Scharlach R only a few fat-containing cells were present. The most striking feature of the picture was the excess of fibrillary astrocytes walling off the wound from the surrounding structures (Fig. 6).

FIG. 6.

Throughout this research careful attention was paid to the question of the possibility of the astrocytes acting as removers of effete products. In no section were fat globules observed in any astrocytes ; further, no cells of this type were seen to take any part in repair other than in the walling off of the wound produced by the injected blood.

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CONCLUSIONS.

(1) Microglial cells are the chief elements concerned with the phagocytosis of damaged brain tissue and in part with the removal of red blood corpuscles, lying free in the brain substance.

(2) Large monuclear cells, probably derived from the reticuloendothelial system, are also concerned with the removal of red blood corpuscles.

(3) Microglial cells commence to remove products of degeneration within a few hours of wounding.

(4) Microglial cells may engulf red blood corpuscles in the early stages and contain pigment in the later stages.

(5) Astrocytes degenerate rapidly and only commence to recover and to wall off the wound at the end of five days.

(6) Astrocytes do not act as phagocytic agents.

(7) Red blood corpuscles may remain as such in the cerebral tissue for not longer than twelve days.

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To Professor Fraser I am indebted for his stimulating interest and to Dr. Greenfield, pathologist to the National Hospital, Queen Square, for the opportunity of consulting the writings of Del Rio-Hortega.

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THE NERVOUS SYSTEM IN CLEIDOCRANIAL DYSOSTOSIS: REPORT OF A CASE.

By R. M. STEWART, Leavesden.

In the thirty years which have elapsed since Marie and Sainton first described the congenital abnormality of the osseous system named by them cleidocranial dysostosis about one hundred cases have been recorded. The number of pathological reports is, however, very small, and for this reason it may be of some interest to describe the post-mortem findings in a typical example of this disease.

REPORT OF CASE.

Full clinical notes of the case were published in the Annual Report of the Metropolitan Asylums Board for 1924-25[1], and it will be sufficient to state here that the patient was a partially demented female who presented all the characteristics of cleidocranial dysostosis in a typical form (Fig. 1). In

Fig. 1. The patient, showing the characteristic facies and thoracic deformity.

addition she showed a slight degree of spastic paralysis of the lower limbs and physical signs of mitral and tricuspid stenosis; the latter condition was directly responsible for her death, which occurred in her forty-seventh year.

Post Mortem Examination. *Nervous System. Brain.*—The dura mater was thickened and firmly adherent to the skull cap. The soft membranes were opaque and markedly thickened in the neighbourhood of the anterior extremity of the great longitudinal fissure.

The brain, which weighed 29½ oz., was small, rounded rather than oval, and its configuration altered in an unusual manner: the frontal poles were small and so extremely narrow from side to side that, viewed from the vertex, the appearance was totally unlike that seen in any other condition (Fig. 2).

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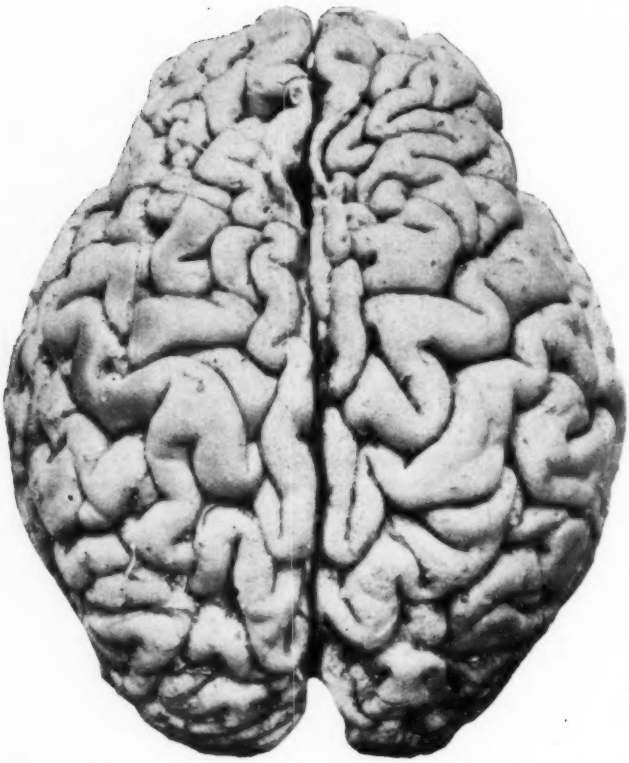

Fig. 2. Cerebral hemispheres, showing the narrow frontal poles and large central gyri.

The prefrontal gyri were small and of a complex pattern which differed slightly on the two sides. The superior frontal convolutions were narrow, shrunken and firm to the touch ; the middle and inferior frontal gyri were also poorly developed, but showed no evidence of sclerosis. In contrast with these, the precentral, postcentral, and to a lesser extent, the superior parietal convolutions were huge—larger, indeed, than those of a brain of normal size and weight.

Owing to the smallness of the frontal poles, the temporal gyri were visible to a considerable extent when the brain was viewed from above.

The cerebellum, pons and medulla oblongata showed no abnormality. A vertical coronal section in a plane through the rostral end of the corpus callosum revealed marked atrophy or agenesis of the gyrus cinguli on both sides. Equally striking was the poor development of the anterior end of the

corpus callosum, which was seen as a thin band uniting the centrum ovale of the two hemispheres (Fig. 3). When traced in a caudal direction the body of the corpus callosum rapidly increased in thickness, becoming normal at the splenial end.

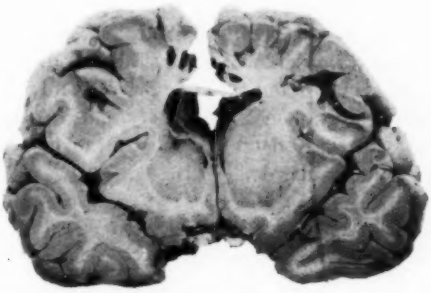

Fig. 3. Coronal section, showing atrophy of the rostral end of the corpus callosum and of the cingular gyri.

A further point of interest was the asymmetry of the caudate and lenticular nuclei, those of the left hemisphere being unduly small.

Other sections made in a caudal direction showed that the optic thalami were of equal size, and the internal capsules free from gross pathological change.

Sections through the brain stem and spinal cord showed no naked-eye abnormality.

Microscopic Examination.—Sections through the sclerosed cingular gyrus showed a complete absence of mature nerve-cells, the neuronic development being represented by a few neuroblasts, globular in shape, and almost devoid of processes. Blood vessels were scanty and the grey matter was almost entirely composed of enormous numbers of fibroblastic astrocytes (Fig. 4).

The motor cortex showed Betz-cells in various stages of chronic degeneration.

Spinal Cord.—The direct and crossed pyramidal tracts furnished no evidence of degeneration, and it is to be particularly noted that there was no dilatation of the central canal in the grey matter.

DISCUSSION.

In a recent publication, Léri and Trétiakoff report the presence of gross inflammatory and hæmorrhagic lesions in the brain of a dysostotic woman who died in her thirty-first year. The dura mater was firmly adherent to the calvaria, and the pia-arachnoid much thickened, especially in the occipital region. When the brain was sectioned a large cyst was found in the right occipital pole, closely related to the posterior horn of the lateral ventricle, but

not actually communicating with it. The wall of the cavity had a neuroglial lining, and its vascular origin was indicated by the presence in it of hæmatoidin crystals and a number of obliterated vessels.

In the opinion of these writers a cavity of this nature cannot be regarded as purely fortuitous, since analogous lesions have been noted before in this disease. In Marie and Sainton's first case a large syringomyelia was present, and in another specimen described by Schaulthauer cavities the size of pigeon's eggs were found in each frontal lobe. The similarity of these morbid processes and their probable origin at about the end of the second month of development, when the clavicles are commencing to ossify, suggests the possibility of an inflammatory process which determines both the cerebral lesions and the malformations of cleidocranial dysostosis.

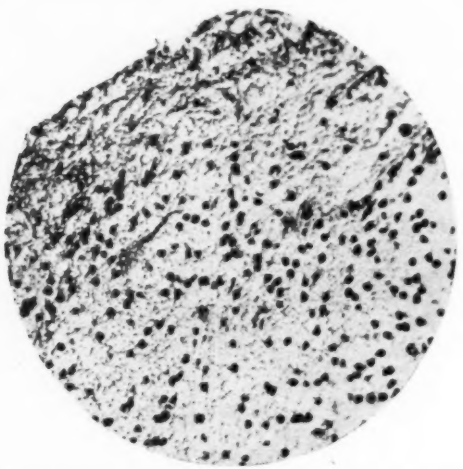

Fig. 4. Low-power microphotograph of gyrus cinguli, showing neuroglial sclerosis and absence of nerve cells.

In the case reported above, although the brain contained no cavities, there was evidence of an old standing inflammatory process; the sclerosis of portions of the superior frontal and cingular gyri, giving rise to the appearance known as pseudo-microgyria, and the presence in these affected areas of a few incompletely differentiated nerve cells, indicated clearly a morbid process sustained during intrauterine life. At what stage it occurred can only be conjectured, but the firm adhesion of the dura mater, the open fontanelle, and the incomplete closure of the sagittal, frontal and lambdoidal sutures which were present point to an interference with development at the end of the second month of fœtal life.

If this be so it is obvious that Jansen's attempt to explain all the signs of dysostosis on the purely mechanical basis of increased amniotic pressure is hardly adequate.

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SLEEP AND EPIDEMIC ENCEPHALITIS.

By IRA M. ALTSHULER, Detroit, Michigan.*

Sleep has been such a persistent concomitant in lethargic encephalitis that one is apt to accept the symptom as pathognomonic of this disease. The term "sleepy sickness" plainly incorporates this idea. Comparing fever and sleep, for example, however, one can rely more on a fever curve than on the occurrence of sleep. Both conditions are an expression of the organism's reaction, but fever is a more 'specific' response of the organic substratum to the noxa than sleep.

He who wishes to inquire carefully into the phenomenon of sleep in any morbid condition, cannot but notice that constitutional, habitual factors, as well as the element of age, etc., preponderate more in the sleep process than the morbid factor proper. It is a well-known fact that children and the aged, for instance, are prone to sleep through many illnesses. Changes in the blood stream (diabetic coma, eclampsia, uræmia, etc.), often produce 'comatose' sleep which by no means can be regarded as pathognomonic. Further, tumours of the brain, compression of the brain, apoplexy, etc., may cause somnolence, which should be regarded rather as an expression of the reaction of the nerve tissue in general.

We must, therefore, inquire into the phenomenon of sleep per se, i.e., its nature, purpose, mechanism, etc., in order to gain knowledge of pathological sleep.

It is timely perhaps to recapitulate briefly some of the more important theories on the nature and causation of normal sleep.

Piéron, as well as many other authors, conceived the idea that a special toxin, called hypno-toxin, is manufactured during the state of activity. The accumulation of hypno-toxin is supposed to produce fatigue of cortical cells and thus cause sleep.

Salmon thinks that sleep is a result of the derangement of the normal constituents of the cells of the cortex. When the chromophil and other substances which the cell receives from the lymph reach their normal amount, the cells of the cortex become alert to external stimulation, and we wake up; when the cells of the cortex reach normality, they are forced to spend the accumulated energy; or, as Salmon says, "We get tired to sleep."

Duval, Cajal, and others utilized the neuronic doctrine for the explanation of sleep. The terminal arborizations of the afferent fibres, according to these authors, are separated during sleep from the dendrites of the cells of the cortex. This withdrawal prevents external stimuli from influencing the brain. Sleep thus results. During wakefulness the intermingling processes are again elongated, and bring the cortex back in contact with the external world.

* From the neuro-psychiatric division, Eloise Hospital, Eloise, Mich. Read before the Detroit Neurological and Psychiatric Society, April 12, 1928.

Tromner advanced a theory which assumes that sleep results from a sudden and complete interruption of sensory impressions on their way to the cortex ("Sinnesblockade"); the optic thalamus, which is known to have connections with all the senses as well as with all parts of the cortex, has been chosen by him as possessing the power of causing this block. He concludes, therefore, that sleep is controlled by that organ. Fundamentally, however, his theory does not differ much from that of Purkinje, who as far back as 1846 believed that sleep results from discontinuity of flow of centrifugal and centripetal impulses.

Stern, on the other hand, believes that sleep is a result of the block of rubrospinal impulses.

Hercouet thought that a sleep centre might exist in the pituitary body.

In June, 1927, von Economo of Vienna expressed his views on the subject substantially as follows. Sleep is a result of the function of two systems. One is that for cerebral sleep proper, and the other is a regulating centre in the mesencephalon. The nervous system thus plays a double rôle in sleep; one is the passive rôle, that of the telencephalon; the other, that of the mesencephalon, exercises a regulating action. Economo relies for acceptance of the double rôle which the nervous system plays in normal sleep on support derived from pharmacodynamics. It is a known fact that not all hypnotics attack the same place in the brain. There are hypnotics which attack the cortex (as for instance, bromides, alcohol, etc.), and drugs which attack the mesencephalon (veronal, luminal, etc.). The posterior wall of the third ventricle and the region of the infundibulum, as well as the aqueduct which lies immediately in front of the oculomotor nuclei, are the parts most concerned in regulating sleep.

Now, it would take too long to analyze each theory separately. One thing is, however, evident, viz., that all these theories not only fail to explain in full measure the mechanism of normal sleep, but neglect to consider the main point, viz., the biological value and significance of sleep, which is essential for its understanding. Each theory brings us face to face with the immediate causation of sleep, but leaves the biological principle of sleep aside. What, then, is, sleep? What is its significance?

We should constantly keep in mind the fact that sleep, primarily, is imperative in the great scheme of preservation 'urge'; and that, in the second place, through the ages it has developed into a habit. Biologically, sleep or rest is peculiar to every living cell, including those of plants. The organization of cells into cell-groups and into organisms, with their complicated activities, only increases this necessity for rest and sleep, and it reaches its height in the higher animals and in man.

The necessity for sleep developed into a will to sleep; this will existed long before the development of any nervous system arrived. In the course of countless years it acquired a condition of automatism. Thus sleep can be

regarded as an automatic manifestation of the will, in the same sense as that employed by Wundt, who looks upon all instincts as mechanical will forces.

There are some strong factors in the causation of sleep. These factors are instinct and habit. The tendency to sleep is a result of the workings of both an instinct and a habit. Just as the climbing of certain plants became habitual for the sake of preservation, so sleep also became a habit, notwithstanding the development of the nervous system and the cortex, with its influence upon higher animals and man. It is characteristic of every habit that it has a tendency to repeat, especially if it is of vital importance and is of a pleasurable nature. One must therefore regard sleep as one of the chief principles of the preservation instinct. The brain's participation in the process of sleep is fundamentally equivalent to the participation of any organ of the body, with the exception that in the course of evolution the nerve tissues became the barometer of the organism's activities. *There are therefore no centres for sleep, properly speaking.*

A conscious form of life arrived with the development of the cortex. We shall later see that this fact became the main point of departure in the sleep of the higher animals and of man.

Our conscious activities are largely enacted by means of conditioned reflexes, which are cerebral units and whose seat is in the cortex. Conditioned reflexes are firmly attached to and are built round an instinct. Events which, under ordinary circumstances, may have little or nothing to do with the function of the organism, as soon as they coincide several times with the workings of an instinct or unconditioned reflex, gain in importance and acquire the ability of causing the same reaction as the instinct itself. Thus these temporary factors act as signals and actually may substitute for or aid the work of the instinct. Conditioned reflexes, appended to the organism, become a strong biological lever; they enrich the organism with a keener and more sensitive equipment, rendering the relation of the animal to the external world more acute. Conditioned reflexes can also be formed within the organism, that is, from internal organs, as for instance, from heart, lungs, stomach, intestines, etc. Their activities are identical with the working of conditioned reflexes formed from the skin and other sense organs, that is, external. The interest and demands of the organism are thus constantly guarded by these two systems of conditioned reflexes.

The two systems work in strong co-ordination, and very often one stimulates the other. In the matter of sleep, conditioned reflexes play the same important rôle as in any other function of the organism.

That conditioned reflexes actually signal sleep to the cortex is seen from the practice of every-day life. Thus when there is no strong desire to sleep, at any time sleep can be induced by means of conditioned reflexes (a process of inhibition). Very often monotony alone or lack of occupation will cause

us to fall asleep ; conversely, when there is a necessity for sleep we can keep awake for a considerable time by stimulating various zones of the cortex through conditioned reflexes.

Pavlov, experimenting on dogs, found that each more or less continuous stimulus which falls upon a definite point in the cerebral hemisphere, will sooner or later lead to sleep. The stimulus does not require to be of vital importance to the organism : stimuli without any vital importance and regardless of how powerful they may be, if they are not accompanied by stimulation in other points, or if the stimulus itself is not changed, will sooner or later, as already mentioned, lead to sleepiness and sleep. The instrument in this phenomenon in inhibition, which Pavlov identifies with sleep. He says that *inhibition and sleep are the same thing.* The process of inhibition has a tendency to spread all over the cortex and sometimes also reaches the midbrain. In other words, sleep in the course of activities of conditioned reflexes, on certain occasions, can be artificially provoked and this without any necessity for it as urged by the sleep instinct. In fact sleep is ' sensed ' in the cortex a long time before there is real demand for it in the organs of the body.

One of the chief principles in the work of conditioned reflexes is that of facilitating free adaptation of the individual to external surroundings. This mechanism is evidently to ensure existence. The tendency is manifest in the entire living kingdom and is fundamental to all forms of life. In lower species it finds its expression in the form of a simple reflex.

It should be remembered that so-called inhibition is not the same as fatigue or exhaustion, which comes after prolonged work by the organism and is a sort of auto-intoxication. Inhibition is a definite physiological process peculiar to all reflexes. From the work of Kabanevitch it follows that fatigue, as seen normally, i.e., within physiological limits, is a result of the function of conditioned reflexes, i.e., is a process of internal inhibition. The physiological mechanism of internal inhibition is connected with various combinations of ion groups, which form a fundamental factor in the process of nerve stimulation. The character and degree of fatigue in each organ, at a given moment, depend on the quantitative concentration of stimulating and inhibiting ionic groups. This type of fatigue should be therefore regarded as a kind of protective valve, which prevents the threatening intoxication by waste products formed in the process of metabolism.

Just as Pavlov is able, by means of a sound, to stimulate the hunger instinct in a dog, when the dog is not even hungry, so in the same manner sleep can be brought about through conditioned reflexes without there being any real necessity for sleep.

The action of conditioned reflexes in producing sleep would be unthinkable were it not for the existence of an instinct of sleep ; from the study of conditioned reflexes we have already noted the fact that conditioned reflexes can only be established round an instinct.

Theoretically we must differentiate between real sleep, as necessitated by the instinct (real fatigue in the same sense as hunger instinct), and conditioned sleep as produced by means of conditioned reflexes. In practice, however, under normal physiological conditions, such a separation is impossible because of the close co-operation of the two. In the pathological state, however, this co-ordination ceases and various alternations in the degree and periodicity of sleep ensue.

If we analyze sleep in epidemic encephalitis, we observe that the type of sleep varies. It is either deep sleep from which the patient cannot be aroused, or else it is light sleep, i.e., the patient can be aroused, answers questions, takes in food, etc. (partial or light sleep). As to the rhythm of sleep, some patients cannot sleep at night, but sleep in the daytime ; others seem not to be able to fall asleep at all, while still others sleep continuously with the degree which we may call light or partial sleep. The more usual type of sleep in acute and chronic lethargic encephalitis is light sleep, i.e., one from which the patient can be readily aroused.

There is enough evidence for the assumption that the instinct of sleep is actually regulated by conditioned reflexes. It is known that sleep and sleep disturbances in epidemic encephalitis begin before there are any marked changes traceable in the midbrain. The acceptance of a centre in the midbrain cannot, therefore, explain the pathological sleep. *We believe that the toxic effect upon the organism is instrumental in changing the ion-concentration in the nerve cell, which in turn changes the inhibition mechanism of conditioned reflexes and results in disturbances of sleep.* Reversibility in the rhythm of sleep can be similarly explained. Continuous inhibition in the realm of conditioned reflexes leads to alternation in the relationship of conditioned reflexes to the sleep instinct. It may also lead to absolute sleeplessness when a number of conditioned reflexes at different points are stimulated at once, usually at the onset of encephalitis lethargica. In deep forms of sleep, similar to coma, the sleep instinct becomes quasi-free. Toxicity of the cortical cells is the cause of absolute inactivity of conditioned reflexes and their respective influence upon the sleep instinct.

We must keep in mind that conditioned reflexes, being capable of inducing sleep, may at the same time act inhibitively towards the instinct for sleep. With the development of the cortex and consciousness, however, the instinct for sleep became modified by conditioned reflexes.

SUMMARY.

(1) There is not sufficient evidence for the acceptance of a regulating sleep centre anywhere in the midbrain.

(2) Properly speaking there are no centres for sleep ; sleep is the expression of the work of an instinct strengthened by habit and regulated by conditioned reflexes.

(3) The cortex, the place of activity of the conditioned reflexes, being the centre of consciousness and wakefulness, assumes the leading rôle in sleep.

(4) In pathological states where the cortex is directly or indirectly involved, the signalling of conditioned reflexes for sleep becomes irregular and inadequate; thus states of sleepiness, sleeplessness or irregularity in rhythm are the result.

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Short Notes and Clinical Cases.

THE OCULO-AURAL MOVEMENT.

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INTRODUCTION.

In 1908 Kinnier Wilson[1] reported his observations on a series of 50 individuals with reference to an associated movement of the eyes and ears. When the eyes were voluntarily moved laterally an associated curling backwards was observed in either or both pinnæ. He found this phenomenon present in 40 per cent. of his series, and also noticed that upon conjugate deviation he obtained an ipsilateral movement of the ear more often than a contralateral.

In 1909, H. S. Stannus[2] continued these observations upon one hundred males of the Bantu tribe in Nyasaland, his suggestion being that the more primitive races might be expected to show these movements more frequently than Europeans. He tested one hundred males and found that 66 per cent. showed movements of one or other pinna. However, this observer noted the greater incidence of contralateral movement, as opposed to Wilson's original findings.

Carmichael and Critchley[3] in 1924 further investigated this matter by examining 400 cases. They also described several other facial associated movements. They agreed with Stannus in finding that the contralateral movement was commoner, and furthermore noted that the phenomenon was more readily elicited in males than in females.

In 1928 R. M. Brickner[4] examined a series of 200 cases. He found the movement present in from 70 to 80 per cent. of the subjects—a higher incidence than that noted by any previous observer. He also found the contralateral movement much commoner than the ipsilateral. Believing that this movement might be mediated through the corpus striatum and the substantia nigra, he examined a number of cases of paralysis agitans, finding it, however, to be present in all these cases. He suggested that the phenomenon might be useful in estimating the functional capacity of the facial nerve, inasmuch as all observers agree that this movement is executed by a contraction of the transversus auriculæ muscle which is supplied by twigs from the seventh nerve. He found, in support of this idea, that there was no movement on the affected side in the presence of marked facial weakness; furthermore, that there was a striking diminution in the range of movement even in the presence of mild facial paresis.

PERSONAL STUDIES.

Our findings are based on a series of one hundred cases comprising fifty males and fifty females, chosen more or less at random from the wards of the National Hospital, Queen Square, London.

The first important point which emerges from our observations is the almost invariable presence of the phenomenon. It was noted in 98 per cent. of our cases. This increased percentage we attribute largely to the method of observation adopted. It was found much easier to detect slight movements of the pinnæ if one observer were facing the patient and directing the conjugate deviation of the eyes, while the other watched the ears from behind.

The second point was the greater amplitude of the movement in males.

The actual results obtained are embodied in the accompanying Table (figures expressed in percentages).

	50 Males.	50 Females.
Movement of pinnæ observed	98	98
Strong movements	74	9
Weak movements	24	89
Contralateral movements stronger than ipsilateral	64	42
Ipsilateral movements stronger than contralateral	6	24
Mixed movements	30	30

It became obvious as the investigation proceeded that the contralateral movement of the pinna was seen more often than any other single type of response and was more frequently noted in males than in females. Indeed, an analysis of our figures shows that in 64 per cent. of the males contralateral movement was greater than ipsilateral, whereas in only 6 per cent. of the males was the ipsilateral movement, greater. In females, on the other hand, only 42 per cent. showed a greater contralateral movement ,while the ipsilateral movement predominated in 24 per cent. of the cases.

A certain percentage of the cases showed what we designate a mixed movement ; by this we mean that on conjugate deviation to the right the left pinna showed the greater excursion, whereas on conjugate deviation to the left the left pinna also moved more—in other words, a contralateral response to one side and an ipsilateral one to the other.

In only two cases in the series of 100 could no movement of either pinna be detected ; and in one of these subjects the mental status precluded co-operation.

In the one case of Bell's palsy examined we were able to confirm Brickner's observation that the movement is lost on the affected side. However, we were quite unable to verify his finding that the movement was diminished in unilateral facial paresis resulting from supranuclear lesions.

We also found no impairment of the movement in cases of Parkinsonism and Sydenham's chorea which we examined, supporting the view that the corpus striatum and substantia nigra play no essential rôle in the mechanism.

We think it of importance to report that in the two cases of cerebellar neoplasm examined there was no movement of the ear on the side of the tumour.

In conclusion we would like to suggest that this movement be spoken of as the oculo-aural phenomenon of Wilson since it was first described by him in 1908.

SUMMARY.

(1) 100 cases—50 males and 50 females—were examined to study the oculo-aural phenomenon of Wilson.

(2) Some movement of the pinnæ was found in 98 per cent. of all cases examined.

(3) The movement was much greater in amplitude in males than in females.

(4) Contralateral movement was the one most commonly observed in both sexes.

(5) Ipsilateral movement, which was stronger than contralateral, was four times commoner in females than in males.

(6) Mixed reactions were obtained in equal number in both sexes and comprised approximately one-third of the series.

(7) In peripheral facial palsy no movement was noted on the affected side.

(8) In two cases of cerebellar neoplasm no movement of the ear on the side of the tumour was observed.

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Editorial.

A SURVEY OF PSYCHOTHERAPY.

THE fact that one or two recent publications have demonstrated a tendency to revival of the use of hypnosis in psychotherapy suggests some dispassionate examination of the various methods of mental treatment and an evaluation of their scientific validity. It becomes the more necessary to make some such review since not only has psychotherapy now taken a recognized position in medicine, but it has an ever increasing area of application in the out-patient departments of hospitals. We have spoken of a dispassionate examination because in this sphere of therapy there exists a regrettable liability to the formation of exclusive schools of thought, whose disciples follow one method only and can see nothing rational in the use of any other procedure.

It is not only of interest but essentially helpful to keep in mind the historical side of the subject and view its changes during the last thirty years. At the commencement of this period, apart from a vague so-called "moral treatment," hypnotism was the main definite method in use, and followers of Liébault of Nancy made extensive claims for its curative value in functional disease. The bulk of the medical profession, however, looked askance at hypnotic practice. Even though it was in the hands of competent and reputable physicians, we recollect that in an address to the students at a London hospital an eminent consultant thought it right to give a warning against hypnotism and "other forms of charlatanism." The use of hypnosis in medicine, for varying reasons, never extended far, and its practice became mainly confined to the realms of experimental psychology. Its disuse was stimulated by the discovery that just as good therapeutic results could be obtained by suggestion when the patient was merely in a passive state and without the production of artificial sleep. Whether or no this passivity was a hypnoid state, identical with or akin to the first stage of hypnosis, need not here be discussed. It remains simply to note that a suggestion school sprang up and that at

that time suggestion and psychotherapy were practically interchangeable terms. Always have there existed those who have attacked neurotic disorders by appeals to logical reasoning, and following the publication of works of Dubois and Dejerine there arose not a few who looked upon persuasion as the sole rational method of approach. These, however, voiced themselves but little, and though persuasion was practised a good deal not much was said or written on the subject.

The next great stimulus to psychotherapy arose when the psychoanalytical theories of Freud became known. The fierce discursive battles that took place as to their correct scientific value are fresh in our memory. Since then a definite analytical school of psychotherapy has arisen which tends to regard any other line of treatment as unscientific. Whether the members of this school are followers of Freud, Jung, or Adler, they claim the application of their own special principles involved as the only rational course to pursue.

At the present day, in the majority of cases, the psychotherapist is more or less a strict adherent of one therapeutic cult. This we venture to think is handicapping to both the practising physician and his patient. The former must in the end suffer from a constant one-sided viewpoint, and the latter cannot receive the benefit he should unless he is dealt with, not in a stereotyped way, but in relation to his particular temperament, his type of malady, or according to the amount of time and money he can expend upon treatment. We would therefore make a plea for the creation of a type of psychotherapist who, having had a wide training, is prepared to adopt any method which the circumstances may call forth. It is sometimes the fact that, because of his ultrascientific approach, the patient may go with his nervous symptoms unrelieved. It is true that our aim must always be to attack the 'fons et origo mali,' but how often is there any necessity to explore the uttermost depths of the unconscious mind? How often will not a careful longitudinal survey of the patient's experiences and adaptations point out the road to re-education and consequent mental health? We do not wish to underrate the need of psychoanalysis but only the extent of its application, when a brief psychological analysis in the conscious realms of the mind would suffice. We may fully recognize that suggestion is a 'blind' method of psychotherapy, that the source of the symptoms remains untouched, and that it only works through the use of childish affective forces. Yet, nevertheless, it has a wide sphere

of usefulness. When time is very limited; when the patient's intelligence is such as to preclude adequate collaboration; and when the neurosis is of long standing, the employment of suggestion is commonly called for. This is especially so in our out-patient hospital departments where the patient only visits once weekly. Added help is undoubtedly obtained in such circumstances through the mere emotional outlet afforded by an understanding and sympathetic medical listener.

Hypnotic suggestion comes into a somewhat different category. There is a deeply ingrained fear of its use on the part of a large number of people who refuse to submit to the procedure unless the severity of their suffering or their intense desire for cure overrides their prejudices. Possible insusceptibility to its influence is another point in its disfavour. Hypnosis, however, might in many cases be used more than it is, even if fashion decrees otherwise. During the period of the Great War its employment was amply justified, and we think that, notwithstanding its limitations, it might be more practised in selected cases. For the recovery of dissociated memories it is preeminently serviceable and there is good reason for believing that we can thus obtain a greater suggestive effect than through the procedure of ordinary suggestion. With our modern knowledge of the psychological mechanisms involved in its production and its phenomena, the well-grounded therapist is well able to steer clear of the possible drawbacks attending its application. It must certainly be stressed that the personality of the psychotherapist counts for much and that the removal of symptoms, which is not infrequently credited to some particular method of treatment, would have taken place just as surely if any other mode had been adopted with conviction by the self-same practitioner.

Psychiatry has in the past been too much divorced from general medicine. The cultism which has been so prone to develop in this branch of knowledge has by no means been conducive to unification. We think that psychotherapy would be held in greater respect by the bulk of the profession if those who specialise in it embraced wider views and became less divided amongst themselves. In the main, undoubtedly, far too high a standard is expected of the results of mental treatment. Apart from glaring constitutional anomalies, the type of mind that so easily develops fears and anxieties and reacts to life's stresses in an exaggerated way is not sufficiently taken into consideration. Attempts to bring about normality only bring

disappointment to the patient and disrepute to the physician. In the same way that a poorly developed chest, or some other innate physical defect, is likely to be attended by pathological features, given certain circumstances, so may the inborn structure of the mind be such that abnormalities in that sphere must necessarily result when the calls upon it involve strainful adaptations. In the former case, chronic cough and dyspnœa on exertion are taken for granted, while in the latter the psychotherapist is often expected to attempt the impossible. We feel that in this respect the worker in this field is often unjustly criticized. In days now happily gone by his aid was usually only sought as a last resource when all other means had failed. He is now frequently consulted primarily and we think that his reputation will be still further enhanced if he takes a wider vista in both his theory and his practice.

Abstracts.

Neurology.

NEURO-ANATOMY AND NEUROPHYSIOLOGY.

[141] **Centrifugal influence on centripetal systems in the central nervous system** (Ueber die zentrifugale Beeinflüssung von zentripetalen Systemen im Zentralnervensystem).—B. BROUWER. *Deut. Zeits. f. Nervenheilk.*, 1928, cv, 9.

WITH his collaborators the author has made a series of lesions of a destructive kind in different sections of the cortical visual area of apes, and has been able to prove by Marchi's method that a subsequent degeneration is traceable into the corpus geniculatum externum. According to the part destroyed in the visual area striata is the part with degenerated fibres in the external geniculate found to vary. A kind of projection-map can thus be made out.

It appears, therefore, that the connexion of the latter body, a primary optic centre, with the cortical centre is double, and it is justifiable to assume that the corticifugal tract exercises an inhibitory effect on the activities of the lower visual centre. The significance of this double connexion is considerable, for it may throw light on cortical function in its relation to that of subordinate centres.

S. A. K. W.

[142] **The connexion of the cortex with the neostriatum and palaeostriatum in rabbits.**—L. COENEN. *Kon. Akad. v. Wetensch. t. Amsterdam*, 1928, xxx, No. 7.

FROM a series of experiments on rabbits the following conclusions are drawn.

1. There is a connexion between the area centralis and temporalis and the caudate nucleus by fibres which run through the fasciculus subcallosus partly under the dorsal ventricular lining of the caudate and partly along the dorsal edge of the internal capsule, passing into the anterior part of the nucleus.

2. There is a connexion between the area temporalis and the globus pallidus by fibres which pass into the internal capsule and so reach the globus.

3. There is no cortical connexion with the putamen.

S. A. K. W.

[143] **An experimental study of the cerebellar control of the vocal organs.**—LAURETTA BENDER. *Kon. Akad. v. Wetensch. t. Amsterdam*, 1928, xxx, No. 6.

A SERIES of destructive lesions were made in a number of dogs; they were made in different parts of the cerebellum. In five cases out of nine some defect of vocal cord innervation was observable, and this was carefully studied by cinematographic recording and otherwise. In the four negative cases it was subsequently ascertained that the tissues surrounding the fourth ventricle were entirely protected in each instance by a portion of uninjured cerebellum. The conclusion is drawn that injuries to the vermis (white matter and nuclei) do not produce changes in the function of the vocal cords recognisable by the methods employed.

All of the five positive cases showed some destruction in the vicinity of the fourth ventricle. The only region which was involved in all, however, was at the base of the lingula, whereas this area was intact in the four negative animals. Microscopical study convinced the author that not only the lingula but the neighbouring tissues at the junction of the roof and floor of the fourth ventricle were involved. They included the tractus nucleocerebellaris composed of ascending and descending fibres between the various medullary nuclei and the cerebellum. To this latter group of lesions is attributed significance in regard to disorder of phonation. The vermis can be excluded. The cerebellum in its connexions with the brainstem appears to have some control over the motor activities of the vocal cords in dogs but this control does not seem to be localised in any particular part of the cerebellar cortex.

S. A. K. W.

[144] **The neural paths for nystagmus** (Les voies nerveuses du nystagmus).—P. VAN GEHUCHTEN. *Revue neurol.*, 1928, ii, 849.

THE writer has made a long series of experiments mainly in rabbits and concludes that a destructive lesion of the vestibular nerve (trunk, nuclei, or central continuations) invariably produces a nystagmus towards the non-injured side. The neural paths implicated in this nystagmus pass by the posterior longitudinal fasciculus, and are made up of fibres from the nucleus triangularis crossing to the opposite side and reaching the oculomotor nuclei. No rotation of the body towards the side of the lesion takes place unless the nucleus of Deiters or deiterospinal fibres are involved.

Deviation of the head may perhaps be a consequence of involvement of descending fibres going from the vestibular nuclei to the posterior longitudinal fasciculus. Deviation of the eyes perhaps results from interference with the ascending fibres in the same fasciculus.

J. V.

NEUROPATHOLOGY.

[145] **Experimental studies on the problem of so-called spontaneous encephalitis of guineapigs** (Experimentelle Studien zum Problem der sogenannten Spontanencephalitis der Kaninchen).—H. PETTE. *Zeits. f. Hyg. u. Infektionskrank.*, 1928, cviii, 700.

MATERIAL from the brains of 12 cases of general paralysis was injected into the testes of guineapigs. In five cases a slow chronic meningoencephalitis developed. The histological characters were of the usual type, and there was a pronounced tendency to granuloma-formation. Similar results were obtained in three cases where spinal fluid from general paralytics was injected cisternally.

In seven animals fresh luetic material was injected by the intratesticular route, with a similar positive result in four.

Eleven times was a guineapig infected cisternally with the spinal fluid from cases of acute epidemic encephalitis; in three animals a meningoencephalitis developed which was identical histologically with that already described.

An entirely similar encephalitis, clinically and pathologically, appeared however in a number of animals spontaneously.

Some twenty-seven guineapigs were used as controls, being injected with material of another kind, and all remained healthy, with the exception of one only, in which encephalitis developed, four months afterwards.

In all these cases of meningoencephalitis the process is the same, and is attributable to a microsporidium; the infection is general, though in the later stages the virus has an affinity for the central nervous system.

The conclusion is to the effect that the encephalitozoon cuniculi exists in the animal harmlessly until it is stimulated into pathogenic activity by the presence of infective material which itself has a special tendency to attack the nervous system. Immunbiological equilibrium is then broken down, and the encephalitis appears.

It is considered that the results of these experiments have an important bearing on problems of the activation of infective diseases.

S. A. K. W.

[146] **Punctures of the brain.**—W. PENFIELD and R. C. BUCKLEY. *Arch. of Neurol. and Psychiat.*, 1928, xx, 1.

A HISTOLOGICAL study of punctures of the brain. In one series punctures were made by a sterile blunt brain needle, and, in the other, by a sterile open cannula of the same calibre.

When a blunt brain needle was used, all the injured tissue remained behind, and a closed track containing a connective tissue core firmly attached to the

overlying dura resulted. The track was surrounded by a moderate gliosis in the cortical grey matter, but gliosis did not occur, and there was even a decrease in astrocytes, in the white matter.

When stab wounds were made by an open cannula, and a cylinder of cerebral tissue was removed, a gaping track resulted which contained little if any connective tissue and which was slightly attached to the overlying dura. The track was surrounded by a gliosis in the cortical gray matter but there was none in the white matter. There was, in general, greater formation of adhesions, greater distortion and greater destruction of the brain about the tracks made by a closed needle than about the tracks made by an open needle of the same size.

As a general principle, it follows that if destroyed cerebral tissue is left in a wound in the brain, a cicatrix results containing connective tissue which contracts and causes distortion of the brain ; a greater resultant gliosis also occurs. Superficial adhesions are reduced to a minimum if the damaged brain tissue is removed, and hence for exploratory brain punctures it is preferable to employ the cannula.

R. M. S.

[147] **Changes in the brain in pyæmia and in septicæmia.**—I. B. Diamond. *Arch. of Neurol. and Psychiat.*, 1928, xx, 524.

The author reports two cases of hæmatogenous infection of the central nervous system. In the first, a case of pyæmia, the changes were mainly inflammatory with marked infiltrative and hyperplastic phenomena in the pia-arachnoid, choroid plexus and glia ; degenerative changes, though present, were rather insignificant. The changes were invariably associated with the presence of the staphylococcus pyogenes aureus, which evidently was responsible for the reactive phenomena in the mesodermal and glial tissues. The mesodermal reactions were represented by polymorphonuclear cells, proliferation of the endothelial and adventitial cells and new formation of the capillaries. The glial reaction was represented by granulomas and nodules.

The second case, which was one of septicæmia, differed from the other in the presence of signs of " healing " phenomena, in the form of numerous fibroblasts, masses of glia cells round the foci, mild signs of recent thrombosis in a few of the blood vessels and the better preservation of the parenchyma. The reactive phenomena were in the form of multiple foci of softening, and were the result of invasion of the parenchyma, not by micro-organisms, but by their toxins. For this condition Hassin and Bassoe have proposed the term multiple degenerative softening.

R. M. S.

[148] **Cerebral gliomata.**—E. Arnold Carmichael. *Jour. of Pathol. and Bacteriol.*, 1928, xxxi, 493.

Seventy-five tumours were examined histologically; of these, 62 were classified as gliomata. The classification suggested by Bailey and Cushing was found applicable to the present material.

The author offers a simpler classification, into two large groups, viz.:

(*a*) Spongioblastic tumours.
(*b*) Astroblastic tumours.

These two groups show definite pathological and clinical differences. The former is made up of an embryonic type of cell staining poorly with gold solutions; it causes a reactionary gliosis and is highly vascular at its edge; it presents a microscopical picture of rapid growth and is prone to degeneration; clinically it has a short history; it occurs commonly in persons over 40 years of age; it usually causes focal signs before signs of general intracranial pressure.

The other class contains tumours made up of a more adult type of cell, staining well with gold; it causes little if any reactionary gliosis; it is much less vascular; it is less prone to degeneration and has a longer clinical history; it occurs in persons under 40, and usually causes pressure symptoms before focal signs.

J. V.

[149] **The occurrence of brain-tissue within the nose; so-called nasal glioma** —D. Guthrie and N. Dott. *Jour. of Laryng. and Otol.*, 1927, 733.

The occurrence of brain tissue in the nasal cavity as a development from an embryonic rest of the central nervous system is sufficiently common in young children to constitute a definite clinical entity. Apart from this encephalocele, intranasal tumours containing glial tissue are extremely rare. A case is recorded by the authors of true nasal glioma. It illustrates the penetration of the nasal cavity by a cerebral frontal glioma of the spongioblastic type. The mode of penetration is thought to have been a neoplastic invasion of a minute pressure hernia of the cortex. J. V.

[150] **The pathogenesis of disseminated sclerosis** (Ueber die Pathogenese der multiplen Sklerose).—H. Pette. *Deut. Zeits. f. Nervenheilk.*, 1928, cv, 76.

This paper is concerned with the connexions between disseminated sclerosis and disseminated encephalomyelitis. Three cases were studied clinically and pathologically; the duration of one case was about two weeks, the second about five weeks, and the third about seven years. The type of the first two was that of acute ascending paralysis with involvement of the lower cranial nerves.

No distinct pathological separation of disseminated sclerosis from the other can be made. Any differences are those of degree and not of kind. Complex factors of an etiological and constitutional kind are responsible for the variations in the course of the two.

The elective affinity of the morbid agent for a particular tissue, viz., one of ectodermal origin, characterises the histological picture. The parenchyma is the first to suffer, especially the myelin sheaths, while vessels and meninges (mesodermal) exhibit secondary reaction. The type of tissue reaction suggests that the agent is a living virus.

Disseminated sclerosis offers close resemblances to certain kinds of encephalomyelitis which in recent years have been seen to follow infective conditions such as mumps, chickenpox and vaccinia. Yet the actual relationship has not been established.

S. A. K. W.

[151] **Acrodynia : A study of the pathology.**—J. W. KERNOHAM and R. L. J. KENNEDY. *Amer. Jour. Dis. Child.*, 1928, xxxvi, 341.

THE authors record one case of erythrœdema-polyneuritis, that of a boy, age 23 months, on whom an autopsy was obtained. The child, on admission to hospital, showed a generalised papular eruption, stomatitis, gingivitis and loosening of the teeth. Photophobia and restlessness were very marked. The gait was ataxic, and there was lack of reaction to pinprick. The condition of the reflexes is not recorded. Death occurred on the eleventh day.

They quote the various necropsy reports in the literature. Warthin's two cases showed generalised œdema and signs of slight meningeal irritation. He felt that the condition might be due to a food deficiency, and suggested that it might be an infantile form of pellagra.

Byfield considers it to be primarily a disease of the nervous system, and is supported in his contention by Paterson and Greenfield, who called it a polyneuritis affecting particularly the pheripheral parts of the nerve trunks. There was marked myelin destruction in some fibres of the peripheral nerves and some of the anterior horn cells showed chromatolytic changes in their two cases. They considered the condition to be similar to but distinct from Bashford's "acute infective polyneuritis."

In the authors' case the findings of importance were also in the nervous system. They found fragmentation of varying degree in the myelin sheaths of the peripheral nerves, more marked in those from the lumbar than the brachial plexuses. There was also chromatolysis in the dorsal ganglia cells of the lumbar and thoracic roots, in some sacral anterior horn cells, and in the cells of the lateral horns and Clarke's column in the thoracic region. Chromatolytic changes were also found in the cells of the cineritia teres, the mesencephalic root of the fifth nerve and the locus cæruleus. Both Gasserian ganglia showed extensive chromatolysis and similar changes were seen in some cells

of the lenticular nucleus and of the anterior nucleus of the thalamus. The changes appeared to be an axonal reaction rather than a primary chromatolysis. There was no evidence of infection in the nervous system.

They found no changes in the cerebral or cerebellar cortex and no increase of glia cells throughout the cord.

In conclusion they state that the association of disease of the upper respiratory tract with the degenerative changes found in the nervous system in this condition, favour the view that it is probably due to an infection, the toxins of which affect the nervous tissues. P. W.

SENSORIMOTOR NEUROLOGY.

[152] **New ideas as to the genesis of transient hemiplegia and cerebral softening** (Les idées nouvelles sur la génèse de l'hémiplégie transitoire et du ramollissement cérébral).—J. LHERMITTE. *L'Encéphale*, 1928, xxiii, 27.

AN interesting exposition of the present status of the problem of evanescent cerebral attacks associated with old age and with arteriosclerosis. The author first discusses the vexed question of a possible nervous control over the cerebral arterioles, and quotes at length Florey's work on the capillary reactions towards various types of stimulus. Passing to the clinical aspect of the subject, Lhermitte throws doubt upon the conception of vascular spasm in the production of transient hemiplegias; he inclines towards a hypothesis which has long been familiar to English medicine and which has lately received a fillip from the work of Naffziger, viz., the theory of local ischæmia from an attack of relative hypotension. Thus a state of transient hemiplegia is regarded as the result of two factors; first, the presence of diseased and partially occluded blood-vessels, and secondly, an incidental and temporary lowering of blood-pressure with a local relative retardation of the blood-stream. The importance of this view-point in determining the correct therapy is of course obvious, and stimulating measures (adrenalin, digitalis, saline injections) are advocated. Lhermitte extends this conception of relative hypotension so as to embrace the pathogenesis of encephalomalacia. He quotes the work of Foix and Ley, who demonstrated that—contrary to the previously accepted view—complete vascular occlusion is the exception in cases of cerebral softening.

These views will not prove novel to English neurologists. Although almost certainly the correct explanation of many instances, this hypothesis must not, however, be strained so as to include every case of transient ictus. It seems more probable that evanescent attacks are of varying origins, and that the morbid physiology differs according to the nature of the arterial changes, the presence or absence of hypertension, the age of the patient and other allied factors. M. C.

[153] **Left hemiplegia and hemianaesthesia dolorosa in a case of CO poisoning** (Hemiplejia y hemianestesia dolorosa izquierda en un caso de intoxicacion por el CO).—A. F. Vamauer and A. Battro. *Revista Oto-neuro-oftalmol.*, 1928, iii, 389.

As a result of poisoning with CO gas a patient developed a left flaccid hemiplegia, with a more or less complete thalamic syndrome, and also exhibited general symptoms of a toxic psychosis. The unilaterality of the neurological symptoms is unusual in cases of this kind, in which more commonly the corpora striata are involved, either by hæmorrhages or by necrotic changes.

S. A. K. W.

[154] **Cerebral haemorrhage in younger persons** (Zur Frage der Hæmorrhagia cerebri bei jungeren Menschen und deren differentieller Diagnose).—Otto Marburg. *Deut. Zeits. f. Nervenheilk.*, 1928, cv, 22.

Some cases of cerebral hæmorrhage in persons regarded as not having reached the degenerative period (ages 43, 50, 33, 40 respectively) are described with considerable detail; one in particular is subjected to the fullest pathological examination. The view adopted is that, in the absence of cardiac and renal disease and of hyperpiesis, the condition apparently must be ascribed to a certain thinness of the bloodvessel walls recognisable microscopically, and to a certain homogeneous degeneration therein, almost amounting to a necrosis, especially in the neighbourhood of the extravasations. No definite decision, however, on the question of whether these changes are primary or secondary, can be given. The hæmorrhages were not a mere diapedesis. Mention is made of 'purpura cerebri.' Differential diagnosis is also discussed.

S. A. K. W.

[155] **Transient insulin hypoglycaemic hemiplegias.**—J. M. Ravid. *Amer. Jour. Med. Sci.*, 1928, clxxv, 756.

Ravid summarises briefly the various untoward reactions which have occurred during insulin hypoglycæmia, and describes a case of his own in which he observed as a reaction transient but complete hemiplegia on two occasions. The hemiplegia, ushered in on both occasions by left-sided numbness, progressed to a total, flaccid, left-sided paralysis with all the signs of a right capsular lesion. This reaction lasted on one occasion seven hours, on the other three hours, and disappeared leaving no residua. In this case, that of a man, age 34 years, atherosclerosis and cardiorenal disease could be excluded with reasonable assurance.

The author brings this phenomenon into line with other syndromes sine materie and mentions the transient hemiplegias occurring without organic change in tuberculosis, alcoholism, uræmia and pneumonia. It is interesting

to note that they are especially frequent in diabetes, and this fact emphasises the importance of demonstrating an actual hypoglycæmia in all so-called cases of insulin reaction. A definite hypoglycæmia was demonstrated on both occasions in this case.

The mechanism and nature of the action of insulin are discussed, and it is suggested that in all hypoglycæmic reaction there is a definite effect on the central nervous system. How this effect is initiated or what its nature is, is as yet matter for speculation. P. W.

[156] **Echographia** (Ueber Echographie).—Otto Sittig. *Monats. f. Psychiat. u. Neurol.*, 1928, lxviii, 574.

By echographia is meant involuntary copying of writing or print when the patient understands that he is to answer a written or printed question, not to copy it. Clearly several possible sources of error have to be eliminated before a case can be admitted into the category; above all, the investigator must make sure that the copying is not being done voluntarily.

Only a very few cases of this kind have hitherto been recorded. Sittig reports two personal cases which seem to be free from objections. The first was one of cerebral hæmorrhage, with right hemiplegia and motor aphasia; the second, tumour of the left facial area. In the latter, echographia appeared as a transient symptom after operation.

An interesting and critical discussion of the symptom is given by the author, who advances reasons for regarding it as a cortical reflex, released by failure of transcortical inhibitions.

S. A. K. W.

[157] **Decerebrate rigidity from a clinical and physiological standpoint.**—N. Zand. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 105.

The literature of decerebrate rigidity is reviewed and it is pointed out that this phenomenon depends on the integrity of a structure or structures between the midbrain and the medulla, since it does not appear until ablation has extended to a region below the thalamus; section of the medulla abolishes it, flaccidity of the limbs supervening. Experimental work on rabbits shows that the destruction of the inferior olives abolishes decerebrate rigidity. Three cases are quoted in which although the olives were intact their connexions with higher structures were interfered with. R. G. G.

[158] **A contribution to the study of epilepsy.**—J. Notkin. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 321.

An exhaustive study of the literature is undertaken. Some 39 cases are studied and the author concludes that in spite of the vast amount of work done no very clear conception has yet been arrived at.

The subject has been approached from every possible angle; perhaps the most recent psychogenetic approach is significant, though the author has noticed the conspicuous absence of the so-called typical epileptic personality make-up in certain cases. It is possible that a multiplicity of etiological factors has to be considered in genuine epilepsy, some being due to biochemical disorders while others may be ascribed to errors in the nervous system. With regard to the latter factor it may be we require more autopsy examinations of early cases before secondary changes have taken place. R. G. G.

[159] **Metabolism in epilepsy. IV. The bicarbonate content of the blood.**—W. G. LENNOX. *Arch. of Neurol. and Psychiat.*, 1928, xx, 155.

A STUDY of 100 patients indicated that, in the main, epileptics show a normal condition of acid-base equilibrium in the body fluids. Abnormality when present is in the direction of increased alkalinity. R. M. S.

[160] **Attacks of microteleopsia, uncinate fits with homonymous quadrantic hemianopia, without papilloedema, due to a glioma of the temporal region** (Attaques de microtéléopsie, attaques uncinées avec hémianopsie quadrantale homonyme par gliome de la region temporale, sans stase papillaire).—LUDO VAN BOGAERT. *Jour. de Neur. et de Psychiat.*, 1928, xxviii, 561.

THE chief clinical features in the case recorded comprise: (1) transitory attacks of sensory aphasia, with jargonaphasia and jargonagraphia. These attacks gradually led up to a permanent state of defective speech, with loss of acquired (foreign) language.

(2) Uncinate seizures with dreamy states, peculiar hallucinations of taste and smell, tingling round the mouth, pain in the nose, and œsophageal spasm.

(3) Transient attacks of ataxia with dysmetria and intention tremor.

(4) A quadrantic homonymous hemianopia.

(5) Various transient visual phenomena:—

(*a*) Chromatopsia of a blue or violet tint.

(*b*) Bizarre distortions in the appearance of persons and objects.

(*c*) A particular feature which the author speaks of as "microteleopsia." The patient's surroundings seem to be transported far away, everything seems small and at a distance; the patient goes on talking but raises his voice and talks loudly in order to make himself heard.

Papillœdema was absent throughout the three years over which the symptoms had developed.

Although operation revealed a cystic tumour lying deep within the substance of the left temporal lobe, the exact location of the tumour is unfortunately not stated. M. C.

[161] **The frequency and curability of tuberculous meningitis** (Ueber Häufigkeit und Heilbarkeit der tuberkulösen Meningitis).—F. H. Lewy. *Monats. f. Psychiat. u. Neurol.*, 1928, lxviii, 402.

Attention is directed to the fact that varieties of tuberculous meningitis occur with much greater frequency than is usually supposed to be the case, and also that in not a few instances the condition is chronic and may, moreover, be recovered from. The diagnosis is made naturally by the discovery of the bacillus in the spinal fluid, but it is well to realise the usefulness of other present-day methods of examination. Reduction of sugar in the spinal fluid, with increase of protein and little change in chlorides, is highly characteristic and the combination is by no means rare. Yet not a few cases of this kind improve with treatment. No real distinction is to be drawn between meningismus and meningitis; such differences as exist are quantitative, not qualitative. Clinically the occurrence of "toxic meningitis" is common enough. A description is given of personal cases, and others from the literature, in which tuberculous processes of different kinds have produced either an actual or a toxic meningitis, and in which amelioration or cure has taken place.

J. V.

[162] **Circumscribed suppurative (nontuberculous) peripachymeningitis.**—G. B. Hassin. *Arch. of Neurol. and Psychiat.*, 1928, xx, 110.

A girl with extensive furunculosis of the body strained her back while performing artificial respiration. Four days later she developed a complete paraplegia of the lower extremities. Death occurred suddenly while she was being prepared for operation.

Pathological examination revealed an obliteration of the posterior epidural space at the level of the ninth to the twelfth thoracic segments by a granulation mass containing three small abscesses. The ganglionic portion of the spinal nerve roots, especially the posterior, showed perineuritis. The cord exhibited perivascular infiltration of the blood vessels of the anterior horns and scattered degeneration of the white columns, both types of change being confined to the lower thoracic region.

The author concludes that the case was an example of a hæmatogenous infection from an extensive furunculosis which had caused a severe non-inflammatory lesion of the spinal cord, with a clinical picture of so-called transverse myelitis.

To the reviewer the presence of inflammatory phenomena in the grey matter of the cord and nerve roots suggests a lymphogenous infection spreading to the dura from a staphylococcal focus which was described as being about one inch to the left of the spine in the lower thoracic region. This alternative is not discussed by the author.

R. M. S.

[163] **Endemic meningococcus meningitis.**—S. McLean and T. P. Caffey. *Amer. Jour. Dis. Child.*, 1928, xxxv, 357.

The authors report on a series of 136 endemic cases of meningococcal meningitis in infants. In their series 67·6 per cent. of the cases occurred in infants under one year of age. The age incidence is the same in both the endemic and the epidemic types. Seasonally the incidence is highest in April and September. They found that maternal nursing had apparently no protective influence and that the predisposing factors were over-crowding, poverty and poor hygiene in the home.

They stress the protean nature of the disease from the purely clinical side and point out that 50 per cent. of their cases were admitted later than one week from onset. Some of the best recognised signs of meningitis they found too variable to be of value in diagnosis. A tache or a positive Kernig or Brudzinski sign is of little value in infants under two years of age. The state of the tendon reflexes and the presence or absence of fever are also of little help.

The signs of greatest value were unexplained irritability, neck rigidity and strabismus. They also found of some value the presence of unexplained skin hæmorrhages, a bulging fontanelle and the history of convulsion at the onset.

Above all they urge the necessity of immediate lumbar puncture in any suspicious case. P. W.

[164] **The clinical and anatomical aspects of the centres for the regulation of sleep** (Zur Klinik und zur Anatomie der Schlafregulationszentren).—H. Pette. *Deut. Zeits. f. Nervenheilk.*, 1928, cv, 250.

Two personal cases are recorded in which hypersomnia and certain other symptoms were associated with basal lesions. In the first of these a carcinoma-like tumour was found in the infundibular region. The patient slept for days at a time, and often fell asleep while eating. After such periods of sleep came shorter periods in which he appeared unusually lively.

In the second case a cystic tumour about the size of a hazel-nut lay in the pes pedunculi, and reached as far forward as the infundibulum ; it bulged into the third ventricle, pushing it over to the opposite side. For weeks the patient lay in an apathetic state, often fast asleep for days at a time, almost without waking. At other times he was less sleepy ; he also often fell asleep at meals.

From these cases, and from other material in the literature, the author concludes that a centre for the regulation of sleep is situated in the vicinity of the third ventricle. He argues that this is a centre for the regulation of the alternating phases of sleep and waking, and that when it is disturbed these phases are disturbed. But the individual function of sleep, as such, is not disordered thereby.

Whether this argument is sound remains to be proved, in the opinion of the reviewer. The two cases here detailed were cases of severe destructive lesions ; if nevertheless a hypersomnia was much the most prominent clinical symptom (as is specifically declared to be the case) then clearly sleep as such must be produced by mechanisms which are not situated in the regions that were destroyed. If sleeping and waking are " regulated " therefrom, the processes of each of these are attributable to mechanisms in activity in some other place than the vicinity of the third ventricle ; but where this may be Dr. Pette gives no hint.

S. A. K. W.

[165] **Arterial encephalography** (Nouvelle technique de l'encéphalographie artérielle ; quelques cas de tumeurs cérébrales).—Egas Moniz. *Presse méd.*, 1928, June 2, No. 44.

The author employs a solution of sodium iodide in 25 per cent. strength, and of this some 4 or 5 c.c. are injected in the following manner. The patient is prepared for operation and is placed in readiness on the radiological table. Under an anæsthetic an incision is made over the common carotid at its lower end and a ligature placed round the vessel. In the next place the external carotid is held ready for grasping with an ordinary artery forceps. The common carotid is immediately raised from its bed with the left hand, and the needle of the syringe containing the solution is inserted into its lumen with the right ; as soon as ever the solution enters, the external carotid is cut off pro tem. with the forceps, the radiologist takes his photograph, the ligatures are removed, and the operation is finished.

The sodium iodide must be chemically pure and in sterilised solution, and should be at body heat when injected. Local anæsthesia with novocain suffices, but a general anæsthetic has also been used. The x-ray photograph must be of instantaneous exposure.

With this technique the author has obtained highly satisfactory pictures in no less than 25 cases, and in tumour cases, employing stereoscopic radiography, has been able to demonstrate displacement of arterial branches by the growth. He believes the method is of value and merits extensive trial.

J. V.

[166] **The thermo- and glyco-regulating functions of the corpus striatum** (Per la conoscenza delle funzioni termo- e glicoregolatrici del corpo striato)—S. D'Antona. *Rivista di Neurol.*, 1928, i, 1.

Old questions of the central representation of body-heat functions have rather been lost sight of in the present-day concentration on the motor functions of the corpus striatum. In this paper is recorded a case of softening of the left putamen associated clinically with a rise of temperature on the opposite side

of the body ; the difference between the two axillæ from the point of view of skin temperature averaged about one half or one degree centigrade during the better part of a fortnight, before death ensued. The case is taken to imply the existence of a heat-regulating centre in each corpus striatum, controlling the opposite half of the body. A discussion of the origin of the patient's glycosuria is also given.

J. V.

[167] **The significance of the ansa lenticularis for choreic phenomena** (Ueber die Bedeutung der Linsenkernschleife für das choreatische Phenomen). —Niessl v. Mayendorf. *Monats. f. Psychiat. u. Neurol.*, 1928, lxviii, 802.

This is a long and not particularly lucid attempt to reconcile two different views of the pathogenesis of chorea, viz., the afferent theory of Bonhoeffer and the efferent theory of the Vogts and others. According to the former, chorea resulting from lesions of the superior cerebellar peduncle (' Bindearmchorea ') gives a clue to the pathogenesis in a defect of afferent regulation : according to the latter, chorea results from lesions of the efferent striatal system, including the ansa lenticularis. The author, if the reviewer represents him correctly, has apparently found that a division of the main ansa lenticularis system runs underneath the lowest part of the optic thalamus in the vicinity of the nucleus ruber, just below the superior cerebellar peduncle ; and he believes accordingly that the two views can thus be shown to be not contradictory, since a lesion in this area will involve both paths. What is missing in this long communication is any indication of the fundamental principles of the interpretation of pathological lesions of a destructive kind in relation to the clinical fact that choreic phenomenology is one of movement, not of paralysis.

S. A. K. W.

[168] **Clinical note on staphylococcus septicæmia with diffuse involvement of the nervous system.**—E. F. Wahl. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 351.

A case of streptococcal septicæmia with secondary involvement of the spinal cord, brain and meninges.

Among other symptoms the spastic smile, emotional instability, waxy rigidity of the arms, tremor of the head, arms and tongue and purposeless movements of the arms and hands, are thought to be evidence of localized involvement of the basal ganglia, which are not usually affected by pyogenic organisms.

R. G. G.

[169] **The syndrome of the superior cerebellar artery** (Le syndrome de l'artère cérébelleuse supérieure).—G. GUILLAIN, I. BERTRAND, and N. PERON. *Revue neurol.*, 1928, ii, 835.

THIS is a fine clinico-pathological illustration of a rare condition, considerably more so than lesions of the inferior cerebellar arteries. Clinically, the syndrome embraced three chief fractures, viz., involuntary movements on the right side, especially of the arm; a right-sided hemicerebellar symptom-complex; and on the left a dissociated hemianæsthesia of syringomyelic type. The involuntary movements are not given an actual descriptive name by the authors; they appear to have consisted of rather slow irregular contractions of flexors and of extensors, or of movements of circumduction of the fingers; they are said to have been less slow than those of athetosis.

The pathological state was one of softening of the superior aspect of the right cerebellar hemisphere and of the lateral aspect af the right side of the upper pons. The superior cerebellar peduncle and the lateral fillet were disintegrated; the contralateral red nucleus showed clearly the extent of this degeneration.

There was no involvement of either the pyramidal system or of any of the cranial nerves.

J. V.

[170] **Two cases of peripheral neuronitis resembling Landry's paralysis.**—R. H. THOMPSON. *Amer. Jour. Med. Sci.*, 1928, clxxv, 807.

Two cases of rapidly ascending symmetrical flaccid paralysis with cranial nerve involvement form the subject of this paper. One of the cases was that of a previously healthy woman, age 48, the other that of a previously healthy man, age 27.

Both began with paræsthesiæ in the toes which were followed by an ascending paralysis. In the first case there was generalised pain and tenderness at onset, followed by stiff neck, a positive Kernig's sign and slight papillitis. There was also a bilateral peripheral facial weakness, right-sided keratitis and difficulty in swallowing. The cerebrospinal fluid showed 51 lymphocytes per c.mm. Deep tendon reflexes were abolished. The only sensory disturbance was tenderness on deep pressure and passive movement of the limbs. Recovery was complete in five months.

In the second case the onset and recovery were much slower. Marked atrophy coupled with R.D., loss of reflexes and fibrillation were present, but there were no signs of meningeal irritation. Postural and vibration sense was lost in the legs. Cranial nerve involvement was also prominent.

The author argues that a toxi-infective process beginning in the terminal fibres will inevitably spread by contiguity to some extent, and that a neuronitis

will be ultimately set up. He adduces the pain which is so common in poliomyelitis to support this contention, and suggests that peripheral neuronitis is the correct name for this type of case. P. W.

[171] **The mechanism of ischaemic and angiospastic pain** (Sur le mécanisme des douleurs ischémiques ou angiospasmodiques).—Albert Salmon. *L'Encéphale*, 1928, xxxiii, 290.

This is a closely reasoned argument to the effect that the cause of the violent neuralgia and pains of many vascular states (angina, migraine, acrodynia, acrocyanosis, Volkmann's ischæmia, etc.) is not the relative ischæmia in itself, or the vasoconstriction, but the resultant venous stasis and relative engorgement. The argument is supported by many ingenious and cogent considerations, which merit attention. The author points out that venous blood is rich in carbon dioxide and products of metabolism, hence its irritative and toxic action: the effect may be exercised directly on the nerve filaments of the walls of the veins, or on the sympathetic plexuses and branches concerned. J. V.

[172] **Meralgia paræsthetica.**—J. R. Huddleson. *Amer. Jour. Med. Sci.*, 1928, clxxv, 823.

The author reviews in some detail the pathogenesis and symptomatology of the meralgic symptom-complex. The three cardinal signs of the syndrome he describes as being pain, paræsthesiæ and some objective sensory loss occurring in the distribution of the external cutaneous nerve of the thigh. The picture may be complicated owing to abnormalities in the origin of the nerve, twigs being obtained from L 1 and L 3 in addition to the main supply from L 2, or owing to peripheral anastomoses with other cutaneous nerves.

He considers that the syndrome may result from lesions of an irritative or destructive nature in either of the first two neurones on the sensory path for pain—that is, either in the dorsal ganglia themselves or in the posterior horns. Furthermore he states that although meralgia is usually thought to be due solely to some peripheral abnormality it is often indistinguishable from some central lesions.

He goes on to discuss the various local and constitutional factors which may give rise to this picture. Trauma, directly affecting the nerve trunk in any part of its course, and various intra-abdominal conditions seem to be the commonest predisposing causes. He also quotes one interesting case which followed a zoster eruption in the distribution of the external cutaneous nerve, and mentions the fact that this syndrome may be the earliest symptom complained of in tabes.

He gives two case histories in full, in one of which the meralgic symptom complex appeared after a bullet wound three inches below the left anterior superior iliac spine, in the other after long-continued pressure produced by leaning each day against a work-table. P. W.

[173] **Juvenile tabes dorsalis.**—H. A. ROSENBAUM. *Amer. Jour. Dis. Child.*, 1928, xxxv, 866.

ROSENBAUM records three cases of tabes dorsalis all occurring in children under twelve years of age. He stresses the fact that juvenile tabes dorsalis differs from the adult disease in several points. The most important of these are that years may pass before the deep tendon reflexes are lost and ataxia appears, that sensory loss and sphincter disturbances are seldom seen, and that mydriasis with loss of the light reflex is the commonest pupillary change.

Two of his cases showed gastric crises, rare in juvenile tabes. Herpes zoster occurred in one case. Ptosis was not seen, nor was there any type of mental disturbance. P. W.

[174] **Compression of the spinal cord in Hodgkin's disease.**—G. A. BLAKESLEE. *Arch. of Neurol. and Psychiat.*, 1928, xx, 130.

THE author reports a case of Hodgkin's disease of about thirteen years' duration with a complicating paraplegia developing after an interval of ten years. The signs of compression receded under Roentgen-ray therapy.

Reports of necropsies in the literature prove that the lymph-granula of Hodgkin's disease can occur in the epidural space as a localised process, and it seems fair to assume Blakeslee's case had a similar localisation.

R. M. S.

[175] **Uveoparotid fever as a manifestation of Mikulicz's syndrome.**—L. P. HAMBURGER and A. J. SCHAFFER. *Amer. Jour. Dis. Child.*, 1928, xxxvi, 434.

IN 1909 Heerfordt published three cases which showed a chronic enlargement of the parotid glands, a chronic iridocyclitis and a long continued low-grade fever. Two of these three patients also showed cerebrospinal paralyses. He proposed the name febris uveoparotidea subchronica for this symptom-complex. Numerous case reports, nearly all from Scandinavia and Germany, followed his paper. The authors record a typical case.

Their patient was a white boy, age 12 years, who had had mumps two years before this illness came on. The malady began with fever, which was rapidly followed by the development of bilateral iridocyclitis and enlargement of the parotids. There were no cerebrospinal paralyses. Improvement occurred

rapidly after radium applications, the technique of which is described. The course and symptomatology of the disease are variable. The most interesting complication is paralysis of cerebrospinal nerves, of which the facial is most commonly affected. Radiotherapy has given extremely good results as regards both the glandular enlargements and the iridocyclitis.

The authors discuss the numerous suggestions which have been put forward regarding the etiology of this condition. It is quite obvious that the disease has no etiological relation to mumps. Heerfordt himself considered a specific virus might be responsible. Since then tuberculosis and syphilis have been implicated by many authors, and yet others regard the syndrome as a subvariety of Mikulicz's symptom-complex. One striking resemblance between the two is that familial types of both have been described.

That syphilis plays a part in producing either Mikulicz's or Heerfordt's syndrome has not yet been proved. It is certain that tuberculosis is the cause of some cases of Mikulicz's syndrome and it is probable that it plays a causal part in some cases of uveoparotitis, if a focal tuberculin reaction can be considered a reliable criterion. The tubercle bacillus, however, has never been demonstrated in the tissues of a case of uveoparotitis either histologically or by inoculation. The authors consider the condition to be a subvariety of Mikulicz's syndrome in which iridocyclitis is the outstanding feature.

P. W.

[176] **A case of amyotonia congenita.**—W. W. Young. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 128.

A case of otherwise typical amyotonia congenita is described in which the external ocular muscles are involved.

R. G. G.

[177] **Effect of age on vibratory sensation.**—G. H. J. Pearson. *Arch. of Neurol. and Psychiat.*, 1928, xx, 482.

The vibratory sensibility was tested in seventy-two persons between the ages of 10 and 90 years, who did not show any signs of organic disease af the nervous system.

It was found that the ability to perceive vibratory stimuli from the lower extremities becomes impaired in most persons after the fifth decade. The degree of impairment increases with age. This impairment is a result of diminished blood supply to the central and lateral portions of the columns of Goll in the thoracic region of the spinal cord, as a consequence of the generalised arteriosclerosis that occurs in the later decades of life.

R. M. S.

[178] **Voluntary extrusion of the eyeballs** (Propulsion do los ojos voluntariamente).—H. FERRER. *Revista Oto-neuro-oftalmol.*, 1928, iii, 403.

THIS presumably genuine case is altogether remarkable and is probably unique. The subject is a young man who has the power of extruding either eyeball, or both, voluntarily to such an extent that it surpasses the degree of proptosis seen in the worst cases of exophthalmic goitre. The photographs accompanying the description of the case are nothing short of amazing.

According to the reporter of the case the "feat" is accomplished by contraction of the obliques and relaxation of the four recti.

S. A. K. W.

PROGNOSIS AND TREATMENT.

[179] **The preparation of serum from human donors recovered from poliomyelitis.**—F. G. MORGAN. *Med. Jour. Australia*, 1928, xv, 264.

THE use of convalescent serum of both human beings and monkeys has been shown to be of value in the treatment of the disease whether naturally acquired or artificially produced. The quantity of blood obtainable from monkeys is insufficient for practical therapeutic purposes. Human donors are hard to obtain. The quantity of blood one can remove from an individual patient is strictly limited and only a small number of successive bleedings can be made from the same patient. The yield of serum is small—only about 150 c.c. being available as filtered serum from each bleeding.

The blood flowing from the convalescent's vein is collected in a vessel containing oxalate solution which is gently agitated during the whole venesection to insure that the anticoagulant is thoroughly mixed. The reds then are allowed to settle to the bottom and the supernatant plasma is syphoned off. A sufficient quantity of calcium chloride is added to the plasma and a clot quickly forms which, when complete, is separated from the side of the vessel with a sterile glass rod or platinum loop.

The specimens of serum from separate donors are arranged in groups and those of the serum of the same group are pooled, and filtered through Pasteur Chamberland F. candles into collecting bottles. Serum is classified as belonging to one of four groups according to the length of time that has elapsed since the donor suffered from the disease. Sterility tests are employed throughout, and safeguards are used to prevent transfer of infective disease from the donor to the recipient.

J. V.

[180] **The serum therapy of poliomyelitis.**—Jean Macnamara. *Med. Jour. Australia*, 1928, xv, 266.

After citing the favourable results obtained by a number of previous workers, the author refers in more detail to the experiences during the New Zealand epidemics of 1924 and 1925. Some 60 per cent. of cases were admitted to hospital at a suitable stage for serum treatment. Under favourable conditions all the patients received intrathecally 10 to 15 c.c. of convalescent serum at body heat, given very slowly by gravity after the removal of from 15 to 20 c.c. of spinal fluid, also very slowly. The older patients received in addition 20 c.c. of serum intravenously and the injections were repeated within 24 hours if the condition required it. The results were highly gratifying, the conclusion being reached that human convalescent serum is a specific in producing prompt recovery and preventing paralysis if given in the preparalytic stage.

As a result of experiences in Victoria in 1925, the 1928 epidemic found the authorities much better prepared. The adults affected in 1925 had been kept under observation, and broadcasting was used to trace others who had moved. Various minor points in technique of venepunction are described, and it is stated that from convalescent adults 15 to 20 oz. of blood were easily removed at one sitting. The potency of the serum is rather low, and it depreciates at room temperature. In Melbourne during the summer and autumn of 1928 13 litres of blood were obtained from convalescents and old patients, principally the adults affected in 1925, and the serum yield has varied between 40 and 50 per cent. The cost of the serum at present is estimated at about two shillings per c.c.

It is very important to make the injection of serum as soon as possible after examination of the spinal fluid has confirmed the diagnosis. For this reason the procedure followed in New York in 1916 has been adopted in Melbourne. In cases seen in consultation outside the hospitals the apparatus for immediate bedside examination of the spinal fluid is always taken; lumbar puncture is performed if the clinical data point to the disease, and the enumeration and microscopical investigation are made at once; the lumbar puncture needle remains in situ, and if the diagnosis is confirmed serum is injected. Thus only one puncture is necessary, and no time is lost.

J. V.

[181] **The treatment of poliomyelitis during the acute and convalescent stages.**—Jean Macnamara. *Med. Jour. Australia*, 1928, xv, 270.

Poliomyelitis after the development of paralysis may be divided into three stages.

1. The acute stage, dating from the onset of the illness until the disappearance of tenderness, a period varying from a few days to three months.

2. The convalescent stage, beginning at the end of the acute stage and continuing as long as recovery of function is proceeding, usually up to the end of two years.

3. The chronic stage, after the termination of the convalescent stage, when the condition is more or less stationary.

Apart from serum therapy, for the acute stage the author recommends sedatives for the first few days to induce rest. The usefulness of hexamine is doubtful. If bulbar involvement is threatened, it is wiser to give glucose and saline per rectum than to worry the patient with repeated attempts at swallowing. The patient should be nursed on a hard bed with a firm mattress, a cradle being used to support the bedclothes. From the outset rest should be as complete as possible and nursing disturbance reduced to a minimum. Details are supplied of plaster beds. Immediate splinting is essential.

Treatment for the second stage is summed up as follows:

1. Obtain the co-operation of the parents for long-continued rest.
2. When the tenderness has gone, commence muscle re-education.
3. Radiant heat and saline baths are useful.
4. Splinting must be constantly supervised and modified to prevent stretching of weak muscles.
5. If abdominal weakness is present, a cloth corset or belt is necessary, even during recumbency, to prevent stretching of weak muscular groups.
6. Standing may be allowed daily for a few minutes, but not if a position of deformity is assumed in order to stand.
7. Sitting, which favours flexion of the hips, scoliosis and footdrop, should be avoided.
8. By keeping the patient from walking during the first year the number of cases of complete recovery is greatly extended.

J. V.

[182] **Pathological researches on the influence of x-ray radiation on cerebral tumours** (Pathologische Untersuchungen über die Einwirkung der Röntgenstrahlen auf Hirntumoren, zugleich ein Beitrag zur Histologie des Glioms).—Otto Marburg. *Arb. a. d. Neur. Inst. Wien. Univ.*, 1928, xxx, 171.

The general conclusion in this paper is one of suspension of judgment. Marburg is rather sceptical as to the actual influence of radiation on the substance of gliomatous tumours. He has examined histologically three cases of tumours submitted to radiation for longer or shorter periods, without being able to satisfy himself that any definite and recognisable process of involution or sclerosis can be set down to its action. He also points out the unsatisfactory nature of some recent classifications of gliomata, in view especially of the fact

that most of these neoplasms are polymorphous. The most one can say is that in some cases one type predominates. For this among other reasons he hesitates to accept evidence that radiation acts on cell and fibre structures in gliomas. But he considers it acts beneficially on the processes which lead to rise of intracranial pressure.

S. A. K. W.

[183] **Radiation treatment of glioma of the brain.**—G. H. Hyslop and M. Lenz. *Amer. Jour. Med. Sci.*, 1928, clxxvi, 42.

Beneficial palliative results of radiation treatment of gliomata of the brain are of a sufficient degree and frequency to warrant its further trial. Patients dying within less than a year after operation respond less favourably to the treatment than those whose tumours allow a longer duration of life. Of 19 verified cases eight showed some benefit from radiation, while two were possibly helped. The dangers of immediate reaction were exemplified in two cases.

Cellular gliomata respond better to radiation than non-cellular. The benefit consists in relief of increased intracranial pressure and diminution of focal signs and symptoms. The duration of relief in a given case cannot be predicted.

Since patients vary in their immediate reaction it is desirable to estimate tolerance by making the first application a fraction of the so-called erythema dose. This precaution is specially important in cases of posterior fossa tumours or of marked intracranial pressure. Pre-operative radiation has certain obvious dangers and disadvantages which make the procedure inadvisable.

It seems desirable to administer maximum doses within four to five weeks after the institution of radiotherapy. The dose to be given should be based on the size, location, and depth of the tumour.

J. V.

[184] **The treatment of serous meningitis by radiotherapy and the use of hypertonic solutions** (Sur le traitement de la méningite séreuse par la radiothérapie et les solutions hypertoniques).—E. Flatau. *Revue neurol.*, 1928, i, 675.

A useful preçis of the genesis and etiology of meningitis serosa is followed by an account of the author's method of treatment, apart from operative measures. Radiotherapy is directed mainly over the regions of the third and lateral ventricles. It is carried out every two to three days for some five or six times; and this is repeated every six weeks for a year, if necessary. In addition, hypertonic solutions are utilised; the author employs a 40 per cent. solution of glucose, injected intravenously, 10 c.c. at a time, every other day for some ten to twenty times. He claims satisfying results.

J. V.

[185] **Parkinsonian rigidity.**—E. Arnold Carmichael and F. H. K. Green. *Quart. Jour. of Med.*, 1928, xxii, 51.

1. Tincture of stramonium in large doses lessens Parkinsonian rigidity and increases the ability to perform fine rapid movements as recorded graphically.

2. It appears to improve the mental condition of the patient.

3. It does not affect the tremor.

4. It is at least as efficacious as subcutaneous hyoscine in large doses, is better than hyoscine by the mouth, and may be given continuously over a long period of time.

5. The optimum dosage necessary to produce this effect varies in individual cases, though it commonly lies between 45 and 60 minims thrice daily.

6. Toxic symptoms even with this large dosage are rarely severe; they may be combated in various ways; they appear to be more common in elderly patients with idiopathic paralysis agitans than in the younger post-encephalitics.

7. The whole tincture of stramonium is more efficacious than atropine or lævo- and dextro-rotatory hyoscyamine.

8. The action of stramonium is palliative and not curative.

Authors' Abstract.

Endocrinology.

[186] **Ophthalmoplegia in Graves' disease.**—A. M. Wedd and H. H. Peyumar. *Amer. Jour. Med. Sci.*, 1928, clxxv, 733.

The authors record a case of recurrence in Graves' disease, where the second attack was ushered in by diplopia. The most striking feature of the recurrence was an almost complete external ophthalmoplegia. The patient ultimately perished in a thyroid crisis characterised by high fever, delirium, dysphagia and loss of sphincter control.

Autopsy in their case revealed marked changes in the suprarenal, thyroid and thymus glands. They regard the thyroid picture as representing an exhausted state, while both the thymus and the adrenal cortex showed degenerative changes.

They comment on the fact that in some cases of myasthenia gravis lesions have been found in the suprarenal glands, and that Marinesco has reported several cases which were benefited by adrenalin administration.

The combined occurrence of Graves' disease and myasthenia gravis is discussed, but they favour the view that myasthenia may be a classic symptom of Graves' disease, and was so in their case. They also quote several cases from the literature showing that ocular and cranial nerve palsies may occur in true Graves' disease. In their own case they regard the ophthalmoplegia as being part of the latter affection. P. W.,

[187] **Psychosis and hyperthyroidism.**—W. O. Johnson. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 558.

The literature of thyrotoxic confusional states is reviewed and 24 cases (which occurred in a series of 2,286 cases operated on for goitre) are described. The condition is not common, but it is serious and frequently has a fatal issue. Operation does not help and indeed is contraindicated. The course of the hyperthyroidism is not generally as violent as in other cases, but death from exhaustion is a serious risk and all cases are liable to relapses. Hallucinations and delusions with a predominance of depressive states are the usual mental phenomena. R. G. G.

[188] **Lipodystrophia progressiva** (Zur Frage der Lipodystrophia progressiva). —Otto Marburg. *Arb. a. d. Neur. Inst. Wien. Univ.*, 1927, xxx, 1.

This paper records the full pathological examination of a characteristic case of the affection. The patient died rather quickly from a 'septicopyæmia,' the effects of which, unfortunately, may to some extent have obscured the findings. In regard to the endocrine system the pituitary was in a condition of excessive hyperæmia, more so than any other organ examined. Structurally it was normal, if rather on the large side. The acidophils were remarkably rich in number, the basophils to a less extent. Between anterior and posterior lobes (pars intermedia) were masses of colloid secretion. Otherwise, the glandular system exhibited only such changes as could be assigned to the systemic infection. No investigation of sympathetic system and vagus ganglia was made, but the tuber cinereum was extraordinarily rich in cells and in a state of hyperplasia.

The difficulties in the way of the interpretation of these histological alterations are recognised, and a non-committal attitude is adopted.

S. A. K. W

Psychopathology.

PSYCHOLOGY.

[189] **Contributions of psychological medicine to the estimation of character and temperament.**—R. D. Gillespie. *Brit. Jour. Med. Psychol.*, 1928, viii, 165.

'Idiosyncrasy' is suggested as etymologically a desirable substitute for 'personality,' to connote the integration of traits of temperament and character in the individual. Clinical experience in the direct observations of affective abnormalities affords no very useful hints for the detection and estimation of emotional states actually present. On the contrary, it seems rather to

emphasize the complexity of the conditions involved. Mere impressions gleaned at an interview may be very misleading. This emphasizes what is found with 'normals.' The usefulness of the conception of a 'general intensity factor' in the emotional disposition is at present in doubt. Instruments of precision, recording the physiological accompaniments of pronounced (abnormal) emotional states, are of little practical value in estimating the kind and degree of the emotional state present. The only satisfactory method of estimating temperament and character is the biographical one (history-taking) checked by accounts from the patient's relatives and friends, and by observation if possible under social conditions of a restricted kind, e.g., in hospital. Traits should not be taken at their face value, but should be as far as possible traced to the sources: and their relationship to other traits and to the total idiosyncrasy, i.e., their 'setting,' should be considered. This is what is meant by the 'genetic-dynamic' analysis of traits. A mental illness is broadly the result of maladjustment of the individual to his environment. It frequently consists in the exaggeration of certain traits of temperament and character which existed in the individual before he became recognizably 'ill.' These traits are therefore maladaptive and increasingly so. Hence from the study of mental illness the relative importance of certain traits for successful adaptation can be ascertained. The emphasis which comes to lie on certain traits and groups of traits is in some respects different from the values deduced from the theoretical considerations of normal psychology. There is some correspondence of certain groups of traits and types of mental illness. The prognosis of the latter depends as much on the pre-existing 'idiosyncrasy' as on the type of illness that develops, some pathological exaggerations of traits being reversible, and others not. The manner of integration of traits in the total idiosyncrasy is of special importance in both normal and pathological psychology. The study of inheritance may lead to a clearer definition of unitary traits. A considerable change in idiosyncrasy may appear at one time or another in the course of the individual's life, the change being determined sometimes by endogenous (or even inherited) factors: and sometimes by a change in the environmental stimuli. Idiosyncratic, like physical, development may be accelerated or retarded by environmental influences, of which the family is the earliest and probably the most important. C. S. R.

[190] **Theories of bisexuality with report of a case.**—FREDERICK L. PATRY. *Psychoanalytic Review*, 1928, xv, 417.

BISEXUALITY is a qualitative anomaly which may be evidenced in psychical or physical panels or both. Hermaphroditic features are a part of normal psychological development, being usually exhibited in children three to five years of age. Its abnormal manifestation in the psychical sphere is probably not due to a congenital disposition of the germplasm but rather to an acquired

anomaly conditioned by early childhood experiences, e.g., vivid identification with a child of the opposite sex, or development of an exaggerated erotic attachment to both parents or their substitutes. Fixation at the bisexual level may also be a cause of the perversion. Endocrinological aberrations such as an admixture of ovarian and testicular tissue in the same individual, or a persistent thymus, perhaps have an influence in the production of the anomaly. The personality of the bisexual type is characterized by instability, introspection, feeling of tenseness, tendency to identification, clinging to the mother or father as the real love object, and strong homosexual tendencies. The best evidence of psychic hermaphroditism is furnished by dreams, either in literal or symbolic form, which are significant of regression to an infantile type of thinking or even of archaic phenomena. The history and examination of adult bisexuals usually disclose psychical or physical attributes of the opposite sex. The psychotherapeutic task of the subject is to find out his own individual attitude, and synthesize the elements of his personality.

C. S. R.

[191] **An investigation of bluffing.**—Ernst Thelin and Paul C. Scott. *Amer. Jour. of Psychol.*, 1928, xl, 613.

Bluffing is here defined as "pretending to have greater knowledge than is actually possessed." Situations conducive to bluffing were secured by inserting irrelevent and fictitious items into tests containing legitimate items. These irrelevant and fictitious items were arranged in such a way that they would not be easily detected in a survey of the material of the test. The extent to which the person taking the test expressed familiarity with items of this fictitious character was scored as bluffing. The findings were as follows.

Among the university groups bluffing was found to be universal. Of the students, 50 per cent. expressed familiarity with 46 per cent. or more of the 113 fictitious items. Among the groups outside of the university, bluffing was found to be much less prevalent, only about 17 per cent. expressing familiarity with 46 per cent. or more of the fictitious items. In proportion to the number of legitimate items checked correctly, the amount of bluffing by university students was but slightly larger than that by the non-university groups. The data show a negative correlation between amount of bluffing and age. On the average the men were found to bluff more extensively than the women. This condition was most marked in the case of the freshmen, the percentage frequencies of bluffing for that group being; men 63·1, women 38·6. The students who ranked highest academically averaged lowest scores in bluffing in the test. Students who bluffed most were those scoring just above the average in the intelligence test, and not those scoring highest. C. S. R.

[192] **The erethitic and kolytic and their relation to the processes of excitation and inhibition (A contribution to the subject of temperament and psychological types).**—J. RAMSAY HUNT. *Jour. Abn. Soc. Psychol.*, 1928, xxiii, 176.

THE purpose of this study is to emphasize the fundamental importance of the processes of excitation and inhibition in determining psychological type, and to show that there is an excitatory or *erethitic**, and an inhibitory or *kolytic* type, based on the predominance of one or other of these functions in the psychic sphere.

Excitation and Inhibition.—In its broadest aspects, the nervous system is composed of an ascending series of sensorimotor levels, representing the whole phylogenetic development of man, and ranging in activity from the lowest reflex to the highest expression of imagination and thought. But in addition to this, we must also recognize two fundamental processes of neural functioning, viz., excitation and inhibition.

The term 'excitation' indicates an increase, or the setting into action of a process, and is the response to a stimulus. Inhibition is the diminution or abolition of the excitatory state. These two processes are co-operative but opposite in function, and their reciprocal balance regulates all activities of the organism. In the vegetative system they are represented by separate nerves. In the central nervous system inhibitory fibres have not been demonstrated, although the process of inhibition is well recognized. Sherrington has shown the existence of inhibition in the spinal cord, in the motor cortex, and in other regions of the central nervous system, and Pavlov has demonstrated its great importance in cortical functioning, in his classical study of conditioned reflexes. In man he believes that habits, based on training, education and discipline, are a complex series of conditioned reflexes. Pavlov also made the observation that there is a variation in the nature of the individual nervous system among his experimental animals and that two definite types stand out with special prominence. One is a type which responds readily to excitatory stimuli in the conditioning experiment, while the other type is more responsive in the realm of inhibition.

Erethytic and Kolytic Types.—In human beings, while the processes of excitation and inhibition share in all neural functioning, it is evident that some individuals are more excitable and others are more inhibitable, in their relations to environmental and other forms of stimuli.

For these two functions are not always present in the same degree and are closely related to chemical, glandular and metabolic activities of an obscure

* Erethitic (Greek: Erethizo), "excite," "provoke."
** Kolytic (Greek: Kolyo), "prevent," "check," "hinder."

constitutional nature. It is interesting in this connexion to recall the existence of vagotonia and sympathicotonia in the vegetative nervous system and their well-known pharmacological reactions. The pathological extremes of these two types are the mania and melancholia of the manic-depressive psychosis. At one end of the scale is mania, with its high degree of excitability of mind and body, flight of ideas, exaltation of mood, and increase of psychomotility. At the other end is melancholia, with retardation of thought and action and depression of mind. Not only is there a disorder of excitation or inhibition in the psychic sphere in these conditions, but evidences of increase or decrease of function is often present in the spinal and vegetative mechanisms.

The *erethitic temperament* is a mobile one, characterized by great activity of mind and body. Such types are easily excited, responsive, impulsive, emotional and quick-tempered, and inclined to be restless. They are many-sided, have many interests and their psychic trend is objective rather than subjective. They live more in the outer world of reality and action than in the inner world of thought. They are mercurial and inclined to be rash and hasty. The psychic tempo is rapid and there is a slight tendency to distractibility. The general trend of this type is toward expression, and they are accessible and sociable.

The *kolytic* temperament, on the other hand, is more calm and controlled, with a tendency to passivity of mind and body. Such individuals compared with the erethitic appear cold, apathetic and indifferent. They are introspective, often heavy and plodding, but when more energetic manifest a quiet concentration of power. They are slow-tempered, self-centred and reflective with a tendency to subjectivity. The psychic tempo is slow. They are the thinkers, the dreamers and visionaries, and show a distinctly repressive tendency and are inclined to be shy and reserved.

These two temperaments represent the predominance of excitation or inhibition in the psychic sphere, but in addition to these there is the great middle group in which the two functions are more harmoniously balanced and where there is no special tendency to excess in either direction.

The psychological types of Jordan, Jung and Kretschmer are also considered, and the question is raised whether the predominance of an erethitic or a kolytic tendency is not the important factor in all.

AUTHOR'S ABSTRACT.

PSYCHOSES.

[193] **The pathological anatomy of the central nervous system in schizophrenia** (Die pathologische Anatomie des Zentralnervensystems bei Schizophrenie).—K. H. BOUMAN. *Psychiat. en Neurol. Blad.*, 1928, xxxii, 517.

BOUMAN begins a valuable paper by mildly complaining of the absence of help from the psychiatric side in solving the problems of schizophrenia. The

brain anatomist is in a difficult position : the clinician is not sure of his own data ; and the psychologist does not think anatomical information necessary. Present-day psychiatry is psychiatry without the cortex.

A readable and succinct *exposé* is given of the course of knowledge during the last fifty years in respect of the pathological changes in dementia præcox, and it is brought completely down to date. It merits careful perusal, for it leads unmistakably to the conclusion that the disease-condition has a pathology which can neither be called in question nor overlooked. Bouman freely acknowledges the contradictions and discrepancies, but they cannot dispel the general feeling that recognisable alterations in the brains of cases of schizophrenia are to be expected ; and he summarises his position in the following way.

Schizophrenia is an organic disease of the brain, consisting in a primary parenchymatous degeneration of the cerebral cortex. Ganglion-cells disappear in a fatty degeneration and sclerosis, without accompanying gliosis of an active kind. This cell death is laminar, and is perhaps best seen in the third layer, but other cell-layers are included, in particular the second and fifth. The change in the cortex is diffuse and sometimes patchy, is independent of vascular distributions and is not associated with the tissue-reactions of inflammation. There is no particular uniformity in the changes in successive cases, but as a rule frontal, temporal, and prerolandic areas exhibit these with the greatest constancy.

Less definite alterations are found in the fibre-systems ; perhaps they are most usual in the internal granular layer, and next in the supra- and infra-granular layers.

The general pathological picture is subject to variations ; in cases associated clinically with periods of excitement a greater degree of glial proliferation is met with, in the form either of glial rosettes or of increase of the protoplasmic glia. In such instances perivascular accumulations of cells containing products of myelin degeneration are seen.

Other matters of pathological interest are discussed, and the question of pathological interpretation is not ignored.

S. A. K. W.

[194] **The clinical aspects of schizophrenia** (Die Klinik der Schizophrenie).—H. C. Rümke. *Psychiat. en Neurol. Blad.*, 1928, xxxii, 421.

The author opens an interesting paper with a discussion of the admitted difficulties in respect of the entity or otherwise of the condition known as schizophrenia, and with a historical retrospect which fully exemplifies changes in conceptions and classifications. Whenever the question of schizophrenia being an entity comes up for decision controversy thickens. A description is

given of the "classical" views, as well as of the most modern. The divergencies between Kraepelin, Bleuler, and more recent writers still are fundamental. The general attitude of the author is both critical and eclectic, and may be expressed as follows.

1. There is a group of psychoses which considered from the viewpoint of course and semiology can be placed together, and in which pathologo-anatomical changes can be found. They represent an actual disease-condition. They correspond in part to the hebephrenia of Kraepelin, the 'Kerngruppe' of Willmann, the genuine schizophrenia of Kahn, and the dementia præcox of Claude. To deny this is in the author's opinion unjustifiable scepticism and mere obstructionism. The entity does not pass over by gradations from the normal. It is a disease-entity; other conditions are disease-pictures.

2. Another group of cases present a schizophrenic syndrome in Bleuler's sense; it is a numerous class, in which probably a definite etiology for the psychosis will be forthcoming (constitutional disease, toxicosis, organic brain affection).

3. A third group consists of cases in which a schizophrenic syndrome arises on the basis of a constitutional tendency to psychosis. The author is doubtful of this group, but states that it may be taken to embrace some types described by Kretschmer, Bleuler, Adolf Meyer and others, where there appears to be a gradual development of the psychosis from a condition of normality.

4. The view that there is a common somatic or mental constitution for all types of schizoid and schizophrenic subjects is merely a working hypothesis; that is the most that can be said for it.

A useful classification of the endogenous and exogenous psychoses is given, which is too long to reproduce here.

S. A. K. W.

[195] **The psychology of schizophrenia** (Psychologie der Schizophrenie).—Van der Hoop. *Psychiat. en Neurol. Blad.*, 1928, xxxii, 457.

After admitting the highly unsatisfactory state of present-day conceptions of the 'disease' called dementia præcox, Van der Hoop argues that its psychological aspect deserves separate study, apart from questions of whether it has a recognisable pathological anatomy or not. He indicates a threefold approach from the psychological side.

1. Schizophrenic peculiarities can be regarded as a general psychical reaction to certain specific and typical disorders which the disease produces in both body and mind.

2. The symptoms can be considered a definite typical form of reaction, a characterological reaction, to difficulties that are not of any specific class.

3. The psychoanalytic line of approach associates the symptoms with disturbances in psychical development, the outcome of abnormalities in the affective life.

Each of these is in turn examined at considerable length, and reasons are given for the view that the third is the most illuminating among them. At the same time it is expressly stated that they need not be considered mutually contradictory, and that all three may be utilised in the exploration of the subject. The author's own conclusions may be formulated thus :

Among the psychological causes of schizophrenia can be recognised (1) an initial defective condition, probably of congenital origin, which need not be thought exclusively endocrinological but may include psychical abnormalities ; (2) a special, inherited, personality-build which may be described as a strong tendency to introversion ; (3) a psychical regression which develops in due course into a condition of introversion, whereby fixations at narcissistic and auto-erotic stages are brought about.

S. A. K. W.

[196] **The motor syndrome of catatonic dementia praecox** (Le syndrome moteur de la démence précoce catatonique).—H. CLAUDE, H. BARUK and A. THEVENARD. *L'Encéphale*, 1928, xxiii, 741.

COMPETENT clinical studies of the motor phenomena of the psychoses are calculated to throw much light on their nature and have hitherto been conducted by only a few investigators. In the present communication the following points have been examined : muscular function, along the lines of electrical excitability (chronaxy) and electromyography ; postural reflexes and reactions of attitude and equilibrium.

It is only in appearance that the catatonia of the psychoses resembles certain organic extrapyramidal affections ; it can readily be distinguished by postural reactions, by pharmacodynamic tests, and by various neurological signs. The physical accompaniments of catatonia exhibit as great variations from time to time as do the psychical. Further, in catatonia the interrelation of physical and psychical is much closer than in organic neurological conditions ; the Parkinsonian struggles against his disability but the catatoniac seems to have a paralysis of volition. One of the authors' patients said : "If I do not move, it is because I do not wish to move ; I have no idea of movement."

The external analogies between catatonia and hysteria are close enough, but on occasion certain neurological signs are found in the case of catatonia which are seen also in some organic nervous affections, but not in hysteria. In these and analogous cases there is not so much a structural basis for the symptoms as an altered state of neural dynamism.

S. A. K. W.

[197] **The employment of 'somnifene' in catatonia** (L'épreuve du somnifène dans la catatonie).—H. CLAUDE and H. BARUK. *L'Encéphale*, 1928, xxiii, 724.

THE method utilised was to inject intravenously doses of somnifène varying from 7 to 10 c.c. according to the size and weight of the subject, and during the resulting narcosis to examine muscle tonus, reflexes, and motor reactions to cutaneous stimuli. Thirteen patients were tested, of whom five were catatonics, while the others suffered from various nervous and mental affections (two hysteria, one paranoia, one simple mental debility, two general paralysis, two postencephalitic Parkinsonism).

In these eight cases the common effect was merely the usual narcosis with relaxation of muscle tone.

In the case of the five catatonics, however, the following notes were made:

(1) Motor symptoms. (*a*) At the outset, complex movements or gestures of a voluntary type. (*b*) Later, signs of decerebrate rigidity, of varying intensity. (*c*) Sometimes, also, an approximation to the signs of spinal automatism.

(2) In two cases, symptoms of pyramidal dysfunction made their appearance.

(3) Disorder of the sympathetic system, with marked exaggeration of the pilomotor reflex.

J. S. P.

[198] **Tentative criteria of malignancy in schizophrenia.**—HARRY S. SULLIVAN. *Amer. Jour. of Psychiat.*, 1928, vii, 759.

WHEN the history of a schizophrenic patient includes the incidence of pavor nocturnus, nightmares and the like, these are to be considered in prognostication as events showing those periods in personality genesis during which exclusion from conscious awareness was used unsuccessfully in dealing with life experience. If they occurred very early, then the character of the experiential material concerned must have been primitive and pre-verbal, and its elucidation will be correspondingly difficult. If they occurred in late childhood or only after the juvenile epoch was reached, then the experiential material involved may well have been fairly easy of formulation in speech, and so fairly readily obtainable and convertible into adult experience, with complete relief of the conflict. The earlier the appearance of rigidity in the self-regarding sentiment, the greater the difficulty of its therapeutic reorganization, and hence of securing a stable recovery. If the child showed very early a marked tendency to temper tantrums, and never outgrew this tendency, a subsequent post-psychotic adjustment of the personality to reasonable demands of social life is not easy to bring about, and can scarcely be expected unless the individual's abilities

available are of an unusual order of merit. Prognosis by " depth of regression " is not rational. The hebephrenic, whose behaviour seems to rest at the " depth " of early childhood or late infancy, offers a graver prognosis than the catatonic who has approximated an " intra-uterine regression." " Silliness " is of bad prognostic omen because the act of laughing in that peculiar way reflects a self far from the intelligent rational self which we accept as ours.

Prognostication by age at onset of the recognized psychosis is of but indirect value. In so far as one can find in the history evidence of maladjustment extending back for years before the serious collapse of personality, one is justified in drawing some conclusion as to the abilities of the individual, and as to the stability of his personality integration. If the schizophrenic psychosis actually occurred " out of the blue "—without material individual-environment factors of causation—then surely the prognosis might be anything, for understanding of the illness would elude us entirely. Other things being equal, the age-at-onset factor may be appraised as follows: the younger the patient in the age group from 35 to 17, the better the outlook; in earlier years, the younger the patient, the poorer the outlook because of the improbability that he has ideals and valuations of other person enabling us to establish good rapport in our attempts at therapy.

The promise which oral-erotic patients hold forth seems to reside in the fact that they are *set* to take in from the environment, and that this 'set' works in cultural terms so that they are amenable to constructive experience. It is believed that the favourable prognostic outlook in such cases arises very largely from the working of this factor. Those showing anal mechanisms in psychosis seem very much more prone to disintegration of the personality, in the sense of collapse of social tendencies. The prognostic importance of the " attitude of the ego to the perverse cravings " as concluded by Kempf is amply confirmed. To the extent that the representations in awareness of the motivations which have escaped repression continue to be regarded by the individual as criminal and subversive, to that extent the mental disorder which ensues is to be suspected of an unfortunate outcome. On the other hand, because of the receptive attitude of the oral-erotic who has not progressed to a paranoid maladjustment, the appearance of violent negative response to the erupting motivations in such patients does not carry gravely pessimistic implications, if only because this sort of person is very often able to acquire experience which will lead to more just valuation of matters of fact pertaining to himself. Schizophrenics who are sadistically oral-erotic are more difficult to handle but none the less have the good prognosis of the oral type in general. The anal-erotic type is of grave omen. It is empirically observed that psychoses including as prodromals illusions or delusions concerning unpleasant bodily odours are of unfavourable outlook. Auto-erotic conflicts which carry with them many eye symptoms and mannerisms of the orbital region are frequently resistant to therapeutic approach but do not entirely preclude social recovery.

It has seemed that the use of alcoholic beverages as intoxicants may be credited with supporting the partial integration of a great many people and saving them from graver maladjustments. When alcoholic over-indulgence is closely related to the outcropping of schizophrenic processes, other things being equal, such cases have a somewhat more favourable outlook than those in which such history is lacking. C. S. R.

[199] **The schizophrenic syndrome as a product of acute infectious disease.**—K. A. MENNINGER. *Arch. of Neurol. and Psychiat.*, 1928, xx, 464.

THE author discusses the relationship of acute infectious disease to the onset of schizophrenia, and reaches the conclusion that infectious disease (not to mention other exogenous agents) in certain persons breaks the integrative fabric of consciousness and releases a psychological regression of various degrees and types. The complexity of the subject from the standpoint of classification is illustrated by the author's statement that "the syndromes formerlydesignated 'dementia præcox,' 'toxic-infectious psychosis,' 'amentia' and 'confusional psychosis' are all included, the differentiation in many cases being neither possible nor useful." R. M. S.

[200] **Catalepsy; its relation to pathological sleep, hysteria, and catatonia** (Les crises de catalépsie; leur diagnostic avec le sommeil pathologique; leurs rapports avec l'hystérie et la catatonie).—H. CLAUDE and H. BARUK. *L'Encéphale*, 1928, xxiii, 373.

THIS is an interesting clinical and experimental study of a difficult question. The authors insist with proper emphasis on the peculiar physiological features of the cataleptic state, and on the modification producible in it by pharmacodynamic methods. An attempt is made to separate the intrinsic clinical features of catalepsy from those of organic affections (narcolepsy, epilepsy, etc.), and while it is held that as a rule catalepsy is associated with neuropathic and psychopathic states (hysteria, dementia praecox, etc.), it is argued nevertheless that these latter exhibit a physiological substratum the precise study of which will throw light on the interrelation of psychical and physiological dysfunction.

It is specially interesting to note that the authors allow that much of cortical activity may be unconscious; they show that movements of voluntary type can occur while consciousness is suspended. In this and in other respects they substantiate the views of those who in recent years have held that the physiological study of disorders called psychical holds promise of fruitful results.

S. A. K. W.

[201] **An interpretative study of involutional depression.**—Gerald H. J. Pearson. *Amer. Jour. of Psychiat.*, 1928, viii, 289.

Herein are reported four cases of depression, three of involutional melancholia and one in the involutional period with a seventh attack of manic-depressive psychosis. These productions seem to indicate that the following mechanism produces the attack of depression. A precipitating situation arises in the patient's life whereby his ego receives a wound and the compensations carefully built up over many years fail. This precipitating situation reactivates a similar childhood situation and causes a regression of the libido to a more infantile level—one of oral eroticism. At this level the differentiation between subject and object is vague. The object seems to have signified the ego-ideal—the inhibitions—and this projection of the ego-ideal on the object seems to have made it possible for the ego to incorporate it (' devour it ') into a subordinate position where the hate element in the libido strivings can be vented on it. The patient flees from the precipitating situation into the psychosis and in the psychosis can give full play to his infantile hate against the object, his ego-ideal and his inhibitions, but by doing this he increases his guilt, which he is able to satisfy by punishing his ego for its subordination of the ego-ideal.

C. S. R.

[202] **New clinical aspects of alcoholism.**—J. L. Richardson and M. A. Blankenhorn. *Amer. Jour. Med. Sci.*, 1928, clxxvi, 168.

The authors report on 198 cases of alcoholism seen during the period 1921—1926. They claim that since the introduction of prohibition the consumption of bootleg liquor has caused a change in the clinical pictures seen.

In the acute cases the three outstanding signs are early loss of consciousness in a high percentage of cases, a slight febrile reaction and a transient albuminuria. The cases of neuritis were marked by rapidity of onset, symptoms usually appearing within one month. Weakness, pain and muscular pareses were the commonest symptoms. Delirium tremens is rare at present, probably owing to the changed habits of the chronic alcoholics, who now indulge in sprees but not in daily drinking. Cirrhosis is essentially the same now as before prohibition.

They classify their 198 cases as follows: acute alcoholism, 51; chronic alcoholism, 61; alcoholic neuritis, 18; cirrhosis, 14; delirium tremens, 5; alcohol together with other poisons, 5; and alcohol in connection with accidents, 44.

P. W.

PSYCHOPATHOLOGY.

[203] **Hypochondria: its definition, nosology, and psychopathology.**—R. D. GILLESPIE. *Guy's Hospital Rep.*, 1928, 408.

THE concept of hypochondria is defined as a persistent preoccupation with the bodily health, out of proportion to any existing physical justification, and with a conviction of disease. No other effect than the belief involved in conviction need be apparent; the conviction (like all convictions) defies direct attack.

This concept gives the basis for the nosological isolation of hypochondria as a clinical reaction-type in its own right. The course is chronic but not (over a long period) deteriorative intellectually or emotionally. The patients are nearly always men, so far as the present series goes. This preponderance of the male sex is in accord with the traditional description of hypochondria. It is perhaps explicable on a psychopathological basis. The ages of the present series extend from 19 to 60. Inaccessibility to therapy is the clinical aspect of the firmness of the conviction. This also is illuminated by the psychopathological analysis. Exact nosological definition enables a distinction to be made from what can now be called pseudohypochondrias—hysterias and anxiety states. It also enables us to speak of a hypochondriacal development of an abnormal personality; thus it is accurate to speak of hypochondria in a schizoid personality. Other cases, however, make it necessary to consider the hypochondriasis simply as part of a schizophrenic syndrome.

Psychopathologically, from the content of the hypochondriacal complaints (their localisation, etc.), and from the patient's other utterances, an anal-erotic basis for some hypochondrias is strongly suggested. It is considered that the strong, usually unconscious, feeling of guilt is in some cases the component which clinically makes the conviction of disease so profound and produces the therapeutic inaccessibility. The homosexual aspect of anal-erotism may serve also to explain the preponderance of men among hypochondriacs. Homosexuality in men undergoes much more repression than the same component in women.

The consideration of the indications, in certain hypochondriacs, of the possible unconscious trends involved helps therefore to explain not only the fixity of the hypochondriacal beliefs, but their nature (damage to the bodily health) and, in some instances, the actual localisation of the physical complaints. Incidentally a contribution is suggested to the theories of the etiology of perianal pruritus, which appears in some instances to be an anal-erotic masturbation.

The differences in the response to treatment in the series of cases discussed are of interest and importance. The first patient improved symptomatically for a time with any form of treatment except direct psychotherapy, which he resented, only to relapse again very soon; the second case, with a definitely material basis, recovered completely when the latter was removed; a third

patient (" essential hypochondria "), had never shown a therapeutic response and clinical impressions gave no hope that he ever would. Three cases all recovered in response to psychotherapy (investigation, explanation, and persuasion). These cases were considered psychoneurotic on symptomatic grounds. A similar case improved slightly several times but has always relapsed. In other cases the preexisting personality must be held responsible for therapeutic failure.

AUTHOR'S ABSTRACT.

[204] **The pathology of conditioned reflexes and the so-called psychogenic depression.**—A. G. IVANOV-SMOLENSKY. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 346.

THE author, a pupil of Pavlov during his experiments on conditioned reflexes in dogs, attempted to establish a response consisting of a facilitation to the first stimulus immediately followed by an inhibition in response to the second stimulus. This was beyond the dog's power; he completely failed to achieve the response. At first his response took the form of considerable excitement, with restlessness, barking and howling, followed by a marked depressive stage in which he exhibited all the characteristics of a whipped cur. The analogy with patients who when presented with a conflict involving inhibition of a powerful inherent impulse develop a manic-depressive reaction is obvious. This interesting paper illustrates once more the great importance of Professor Pavlov's work for modern psychopathology. R. G. G.

[205] **Madness in others** (La folie d'autrui).—F. D'HOLLANDER and E. DE GREEFF. *Jour. de Neur. et de Psychiat.*, 1928, xxviii, 619.

BY the expression " interpsychology " Dupré referred to the reactions between the insane patient and his entourage; this present communication deals with a common type of centripetal reaction, whereby the patient suspects the members of his family, his colleagues—or even a large collection of persons—of insanity. Veiller was the first specifically to describe this phenomenon under the title " le délire de la folie d'autrui." The authors here give numerous examples taken from personal cases. Delusions of insanity in others are common in the chronic systematized psychoses and result from a sustained and boundless confidence on the patient's part in his own judgment and intellectual processes. In the early stages the other members of the family have probably adjusted their behaviour or habits in order to comply with the demands of a slowly developing psychosis. At a later stage, when the nature of the patient's behaviour is realized, the attitude of the friends and relations will again undergo a change. Both these reactions will be noted by the patient himself and interpreted as madness upon the part of his entourage.

The authors give an apt illustration in the reaction of a university student who, unknown to himself, was slowly developing myopia. He would constantly complain that the handwriting of the lecturers was deteriorating and that the epidiascope pictures were out of focus. He became impatient with his colleagues when they did not associate themselves with his protests. This peculiar psychism terminated suddenly by the accidental discovery that a concave lens held before the eyes corrected the faults which he had previously ascribed to others. M. C.

[206] **Vagrancy in the young** (Le vagabondage infantile).—Guy Néron. *L'Hygiène mentale*, 1928, xxiii, 214.

The examination of 250 cases of vagrancy, according to the author, gave the following statistical results. Social causes as the most evident factor, 22 per cent.; dementia præcox, 1·24 per cent.; epidemic encephalitis, 2·4 per cent.; epilepsy, 2·8 per cent.; simple intellectual defect, 19·24 per cent.; imbecility, 1·6 per cent.; instability, 20·4 per cent.; mythomania, 2 per cent.; paranoia, 3·2 per cent.; cyclothymia, 1·24 per cent.; instinctive perversions, 6·8 per cent.; cases where several psychiatric factors were present, 19·24 per cent. C. S. R.

[207] **Some considerations of the significance of physical constitution in relation to mental disorder.**—Herman M. Adler and George J. Mohr. *Amer. Jour. of Psychiat.*, 1928, vii, 701.

Among normal and psychotic patients we may recognize various physical forms that correspond to types as described by Kretschmer. There is evidence that these forms in no sense constitute types but that there is a normal distribution of physical characteristics that vary from those that define the asthenic to those of the pyknic build. Significant differences in performance of groups that are widely separated in the normal distribution, and that conform to the type criteria, are demonstrable. These performance differences are such as to associate the asthenic build with the so-called schizothymic temperament. Accumulated observations by many investigators apparently establish a relationship between pyknic build and manic-depressive psychosis. In the psychiatric categories here considered there are two elements: that of normal distribution of qualities common to all members of the group, and the characteristics not common to all the group but only to certain individuals affected by the various causative factors producing these characteristics. C. S. R.

[208] **On the pathology and laboratory diagnosis of paresis.**—F. Proescher and A. Arkush. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 21.

After reviewing Spatz's work on the occurrence of iron in the Hortega and other cells in the brains of general paralytics, the authors review their own

observations based on the use of thiazin red as a stain. They have found iron present both in sections of the brain and in the spinal fluid and consider that these findings are distinctive of general paralysis. R. G. G.

PROGNOSIS AND TREATMENT.

[209] **Insanity as a defence for crime.**—JOSEPH W. MOORE. *Amer. Jour. of Psychiat.*, 1928, viii, 263.

THE points here dealt with are the individual treatment of offenders and the abolition of the jury trial of the question of mental disorder. The first has an important bearing on the defence of insanity, since there are many mental cases which could escape notice as such unless individually studied. The present procedure is based on the theory of making the punishment fit the crime instead of fitting the individual. This fails conspicuously as a deterrent to crime. In a number of large cities individual, sociological and mental study of the prisoner before trial and individual consideration of the punishment or other disposition have already been adopted, usually with the assistance of psychopathic clinics. The classification prison about to be placed in operation at Sing Sing will afford a careful sociological and psychiatric study of each new prisoner by the aid of which the newcomers will be sent to the particular prison and given the particular treatment or occupation which his case indicates. The introduction of a new socio-penal agency is suggested, to function after conviction and either to advise the court or to have the power to prescribe a to what disposition should be made of the offender after a careful study of each case. The commission should be composed of psychiatrists and criminologists of the highest type, and power of sentence would be taken from the judges and vested in this body. A logical result of such treatment of convicted wrongdoers would be the curtailment of the recidivist who would probably receive the much-talked of wholly indeterminate sentence.

A jury should never be charged with the determination of the mental state of an individual; he should instead be examined either by a commission of experts appointed by the court in each case or by a standing commission in the state department dealing with mental diseases, as is the case in Massachusetts. The jury would be called upon to decide simply questions of fact, viz., was the act committed, and was the act committed by the individual accused? The question of responsibility should not be referred to a jury. It is for the experienced psychiatrist to decide this. The report of the commission examining the accused would be submitted to the judge who, if so advised in the report, could commit to a hospital. If the finding indicated normal mentality, the case would go to the jury without comment. On the other hand, if partial responsibility on account of limited mental capacity was found this could be made use of by the judge in passing sentence or if some way of presenting it to the jury without the usual cross-examination could be found it could be used at the trial. C. S. R.

[210] **Sing-Sing clinic a going concern.**—*Mental Hygiene Bulletin*, 1928, vi, 7.

In addition to routine examinations during the year ending June 20, 1928, the clinic made special examinations of 827 prisoners. Of these, 18·3 per cent. were found mentally defective, 3·3 per cent. insane, and only 25·6 per cent. normal. The remainder were distributed among various pathological groups, ranging from those indicating slight deviations from normality to those bordering on the psychoses.

C. S. R.

[211] **Psychiatric service in penal and reformatory institutions and criminal courts in the United States.**—Winifred Overholser. *Mental Hygiene*, 1928, xii, 801.

In answer to questionnaires from 259 public penal and correctional institutions, it was ascertained that 35·9 per cent. employ psychiatrists on either a full-time or a part-time basis. Psychologists were employed by 32·8 per cent. The practice in 50 per cent. was to refer cases suspected of mental abnormality to private physicians for examination. A favourable opinion as to the value of ascertaining the mental, nervous, and physical conditions of prisoners as an aid to their classification and disposition was expressed by 50 per cent. of the institutions.

With regard to the use of psychiatry in criminal courts, questionnaire replies from 1,168 courts of all grades of criminal jurisdiction showed that 9·4 per cent. were served regularly by a psychiatrist on a full-time or part-time basis. The services of a psychologist were similarly utilized by 6 per cent. of the total number. It was the custom to refer defendants to private physicians in 41·6 per cent. Of 584 judges who expressed an opinion as to the value of medical reports in the disposition of cases, 81 per cent. were frankly favourable and 19 per cent. were counted as unfavourable.

C. S. R.

[212] **Sexual education of the young** (L'Education sexuelle des jeunes gens). —Charles Dubois. *L'Hygiène mentale*, 1928, xxiii, 173.

The education of the young from the point of view of a social defence against syphilis is apt to be confounded with sexual education as a whole. This latter should be commenced early and followed up year by year until adolescence as an integral part of general education. It is natural that the parents should undertake this responsibility but the school should also take part in it and introduce into their curriculum a new form of instruction under the name of "individual hygiene" in the lower classes and "sexual hygiene" in the upper ones. The continuance of this teaching, carried on for several years, can only favour the development of a sexual *moral* without which the most urgent warnings will have little or no effect.

C. S. R.

213] **The emotional problems of the physically handicapped child.**—Frederick H. Allen and Gerald H. J. Pearson. *Brit. Jour. Med. Psychol.*, 1928, viii, 212.

Physical disabilities occurring in the early years of life affect the personality largely as they are utilised by the underlying relationships between the parents and the child. When they occur later in childhood the child reacts to them in the same manner as he has learnt to meet other new and difficult situations. It is as essential to treat the relationships between the child and his parents and the attitude of the latter towards the disability at the time of its occurrence, in order that the personality may not be crippled, as it is to treat the disease itself. Such a crippling of the personality is probably a more serious menace to the future happiness of the individual than a very marked disability.

C. S. R.

[214] **A study of the mechanism of inoculation-malaria on the histopathologic changes in paresis.**—W. L. Bruetsch and M. A. Bahr. *Jour. Nerv. Ment. Dis.*, 1928, lxvii, 209.

The author describes the findings in a case in which death occurred during a remission induced by malarial therapy. He finds that the treatment of paresis with inoculation-malaria produces during the paroxysms histopathological changes in the brain, consisting of proliferative phenomena of the capillary endothelium, which must be regarded as part of the reaction of the reticulo-endothelial system. This reaction in inoculation-malaria is as intensive as in typhoid fever, following which disease similar substantial remissions in the cases of general paralytic patients have been frequently reported.

The absence of perivascular infiltrations in the greater part of the cortex in a patient who died at the height of a paroxysm (toward the end of the therapeutic malaria course) suggests the disappearance of infiltrating cells during acute malaria. They persisted to some extent in the temporal lobes and in the corpus striatum. These findings are in accordance with the observations of other authors on the modified distribution of the inflammatory phenomena following malaria. During the malaria and particularly at the time of the febrile attacks plasma cells probably immigrate into the brain vessels, taking part in the phagocytosis of the liberated young plasmodia. After the retrogression of the perivascular infiltrations normal conditions are re-established in the perivascular lymph-spaces resulting in a partial recovery of the ectodermal tissue (ganglion and glia cells).

R. G. G.

Reviews and Notices of Books.

Introduction Biologique à l'Étude de la Neurologie et de la Psychopathologie. By C. v. MONAKOW, Honorary Professor in the Faculty of Medicine of the University of Zurich, and R. MOURGUE, Laureate of the Institut de France, etc. With 33 figures and two plates. Paris: Felix Alcan, 1928. Pp. 416. Price 80 francs.

THIS book, which does not make easy reading, was sorely needed. Any one with a philosophic turn of mind must have been dissatisfied with present-day attainments in regard to the objective data of neurology and psychopathology, for in numerous instances the describer of facts utilises them to support or dispel theories and hypotheses without appreciating the nature of the latter, and has thus been guilty of errors in methodology. For example, it is remarkable how constantly principles of localisation are based on the assumption that the concomitance of a symptom and a discoverable lesion suffices: how frequently the data of experimental neurophysiology in the animal are applied unthinkingly to problems in human physiology; how persistently, in certain quarters, the positive clinical phenomena of the psychoses are linked to lesions of an anatomical kind which are nothing if not destructive.

Among these more or less serious methodological errors the authors direct special attention to the following: (1) the isolation of a phenomenon from the conditions that gave rise to it. This is the fundamental mistake of histopathology after the manner of Nissl, seeing that preliminary questions of nutritive and defence processes are completely ignored. (2) The static conception of function, which neglects the time factor. Integration and disintegration of function cannot be understood without reference to the notion of the evolution of function in time. (3) When evolution passes from one stage to another not only are quantitative differences encountered, but the order of the new has a different biological value from that of the old. In the view of Bergson, evolution is creative; at each stage life is enriched for the future to come. Thus the sexual instinct has differing values at differing periods. (4) Language itself has evolved, and ex hypothesi should be capable of further evolution. Many everyday psychological expressions are insufficient for reconstructing the history of function, and neologisms are requisite. (5) Present-day conceptions of neuropathology are concerned largely with questions of defect. But in the authors' opinion an auto-regulative compensation, of a creative kind, comes into action when function is diminished or arrested. An active force underlies vital activity; it is the "matrice des instincts," which they propose to term the "Horme."

Starting with the instinctual world, five main groups are distinguished and discussed, viz. the formative, conservative, sexual, social, and religious instincts, and their biological significance is estimated. Then follows an examination of biological consciousness or "Syneidesis"—the auto-regulative principle of function. The development of motor function leads to problems of orientation and of causality, from primitive discrimination ("Protodiakrisis") to language and "Praxia."

The second part of the volume examines disintegration of function, the result of (1) dissolution of continuity of neural substance, or (2) of secretory imperfections, producing in the authors' view the psychoneuroses, or (3) of "désintegration en briques," responsible for the psychoses.

Doubtless owing, in part, to the many neologisms which pull the reader up, this volume demands patient perusing, but it repays generously the time given to it. With its general contentions, there can be no serious dispute; it furnishes an admirable *mise au point* for present-day problems of biology; it orients the neurologist and psychopathologist and provokes and compels thought. It is least impressive where it is most debatable—as when the "ecto-mesodermic barrier" is under discussion.

S.A.K.W.

The Brain from Ape to Man. By FREDERICK TILNEY, Ph.D., M.D., Professor of Neurology, Columbia University. With chapters on the Reconstruction of the Gray Matter in the Primate Brainstem by Henry Alsop Riley, A.M., M.D., Associate Professor of Neurology, Columbia University. In two volumes, with 557 illustrations, many in colour. London: H. K. Lewis, 1928. Pp. 1120. Price five guineas.

IN two superbly printed and illustrated volumes Professor Tilney has studied the brain in its evolutionary aspects on a scale never previously attempted. Fifteen years have been devoted to the anatomical preparation of material from the nervous systems of the higher mammals, ranging from the lemur to man, and inclusive of gibbon, orang, chimpanzee and gorilla. This is only the morphological side, however; the researches have also embraced observations of the behaviouristic aspect of the same animals during life. In regard to the former, it is naturally both technical and lengthy, for it consists of elaborate structural accounts of the macroscopical and microscopical anatomy of the neuraxes concerned, beginning in each instance with the surface appearances and fissural pattern of the brain and the naked-eye configuration of the cerebellum and brainstem, and proceeding to a systematic comparison at different brainstem levels of the internal structure, with its tracts and nuclei. In each case, moreover, a valuable reconstruction of the brainstem has been undertaken, coloured drawings being provided of the relative sizes and positions of the various cell-masses of the gray matter in that part of the brain.

When the reader bears in mind the fact that this scheme has been patiently and painstakingly followed in no fewer than eleven of the higher mammals, man included, the labour which has gone to the making of the book appears overwhelming. Yet its distinguished author has never lost sight of his goal in the midst of this anatomical profusion; at the end of each section are summaries with interpretations and discussions of the accumulation of structural data in their bearing on morphological evolution and behaviouristic development. Among the chapters of the second volume are those dealing with primitive and prehistoric man, with his cranial relics, and with the reconstruction therefrom of his types of brain. This part of the book is of course more speculative and thus perhaps more interesting. The author considers it indisputable that a definite prehuman stock existed, at one time, capable of producing both anthropoid apes and man. Some five distinguishing features comprise the 'make-up' of homo sapiens, viz., the human brain, the human foot, the human hand, the erect posture with bipedal locomotion, and a terrestrial mode of life. Moreover, man possesses within himself a "structural plasticity for further development," which has been sacrificed in the case of the apes. To this potentiality Professor Tilney attaches prime importance for the future, and he believes this future lies with the frontal lobes.

We have merely indicated the general lines of this great piece of work, which will be found fascinating reading. It is a pity that the leaded paper for the illustrations makes the volumes so heavy to handle that they can scarcely be read comfortably except at a desk.

S.A.K.W.

Common Principles in Psychology and Physiology. By J. T. MacCurdy. Cambridge University Press, 1928. Pp. 284. Price 15s.

Dr. MacCurdy has undoubtedly given us an important book, and his effort to correlate physiology and psychology is specially welcome at the present time. The general idea of 'pattern' is not new, but Dr. MacCurdy has done much to clarify the conception. The pattern made up in the psychological field of imaginal processes is not, like Semon's engram, a material entity; it is simply an 'arrangement,' and it is to be presumed that conduct is modified in virtue of the form of the pattern, though the author is not always quite clear on this point.

In the first section, dealing with psychological patterns, the integration of images into patterns and the subsequent building up of the mind are discussed. Consciousness is a developing function and consists in a capacity for discriminating between stimuli arising in the immediate environment and stimuli from image patterns. The evolution of intelligence consists in a power to combine unit patterns, together with a capacity for holding these combined images together in a plan.

Appetites and interests are discussed, the latter being held to be an elaboration of the appetitive tendencies to action either in actuality or phantasy, when there is a failure in reaching the object of the appetite at the level where combination of image function is possible. The author holds that attention consists in the activation as liminal images of certain patterns, which thus produce a selective orientation towards certain stimuli.

Perception, depending on the discrimination and integration of images, leads to meaning, which depends on the combining of a perception with certain associations so that the same thing may have a different meaning for different persons.

In the section dealing with physiological patterns considerable attention is given to the influence of function on the determination of structure, and evolutionary processes are explained on this basis. The facilitation of patterns is correlated with Head's doctrine of vigilance and loss of vigilance in such a condition as spinal shock is discussed. In a final chapter the author speculates on the application of the law of patterns to a wide range of problems, from the structure of the atom to telepathy.

While this book is essentially an essay in psychology in its more academic form the medical psychologist cannot afford to neglect it. If the mental patient is to be rescued from the sterility of the pure materialist on the one hand and the exuberance of the unbridled theorist on the other it must be by means of an application of physiological discipline to psychology and of psychological vision to physiology. Dr. MacCurdy implies that a forthcoming book will carry us still further on this road, and to this we shall look forward with the interest aroused in the patterns elaborated in our minds by the present admirable volume. R. G. G.

Contributions to Analytical Psychology. By C. G. Jung. Translated by H. G. and Cary F. Baynes. London: Kegan Paul. 1928. Pp. 410. Price 18s. net.

This new volume of collected papers, in English, from the pen of Dr. Jung, is the first to appear since the publication of his "Psychological Types" in 1923. It is full of remarkably diverse but invariably interesting material, sociological, psychological, and clinical. The mere titles of some of the papers will suffice to indicate what a rich feast for thought is here presented. "The psychological foundations of belief in spirits" avoids difficulties and is in some respects unusually non-committal, but is highly instructive none the less. Spiritistic proofs are as a rule nothing else than psychological products of the unconscious minds of the percipients. A loop-hole is, however, left to console those for whom such a conclusion may appear to shut the door with a bang: "feeling" is a psychological function as genuine as the intellect and if feeling arrives at different conclusions from the other, "we cannot always prove they are of necessity inferior to those of the intellect." "Woman in Europe,"

"Marriage as a psychological relationship," and "The love-problem of the student" deal at large and in a wise way with cognate problems which exercise the minds of many present-day men and women. "Modern" points of view —not always so very "modern," either—are touched on with insight and sympathy, for instance the matter of sexual hygiene, and the question of sexual information. It is held to be true in general terms that the youth of to-day apprehend the problem of sexuality in its whole range earlier and more radically than in the case of the previous generation. With Dr. Jung's statement that "the fact that many pursue such discussions to the point of abuse does not spring from the nature of the problem, but rather from the inferiority of the people who abuse it," all minds capable of even judgment are likely to agree. From the standpoint of the clinician, similarly, we appreciate the wisdom of Dr. Jung's remark, that onanism has bad results mainly if not solely where it involves psychic complications. These three papers are distinguished by their strong psychological common sense.

"The question of the therapeutic value of 'abreaction'" is examined in a critical spirit; any curative effect does not consist simply in the discharge of affective tension; the dissociation must equally be resolved, and on this resolution success depends. From this conclusion the writer passes to a consideration of the alpha and omega of all psychotherapeutic method, viz., the establishment of rapport between physician and patient. These pages are rich in suggestion and practical advice; more than that, they contain a confession of Dr. Jung's own belief, based on experience, that the development of the healing effect lies primarily in the achievement by the physician of an individual relationship with the patient, in which both meet on equal terms, the man in each confronting the man in the other.

More technical papers deal with "Psychical energy" and with "Instinct and the unconscious," among others. In these, as has been admirably said by the translators (whose work deserves all praise), "the readers who have suffered fatigue in the restricted purlieus of psychoanalytical literature will feel again the exhilaration of a wide scientific horizon." S. A. K. W.

Modern Problems in Neurology. By S. A. Kinnier Wilson, M.D., F.R.C.P. London: Edward Arnold, 1928. Pp. 364. Price 21s. net.

Dr. Kinnier Wilson has collected in this volume a number of his recent contributions to neurology, some of which have appeared in the pages of this Journal. Included in the series are his Croonian Lectures of 1925, and other lectures delivered at the Harveian Society of London and under the auspices of the British Medical Association. All have been submitted to critical revision, and some have been modified to no little extent. The first four chapters of the book deal with different aspects of epilepsy; the fifth is on narcolepsy. There are six chapters on the motor system and its problems of involuntary

movement and of disorders of muscle tone. The remaining subjects are "Pathological laughing and crying," "Dysæsthesiæ and their neural correlates," and "The Argyll Robertson pupil."

It will be seen that these papers cover a wide field of research in neurology, and that the topics dealt with comprise a number which are of continuing modern interest. Each chapter is provided with a bibliography, and there are a number of illustrations. In this convenient form the book embodies the views of its author on various vexed questions, and contains an up-to-date presentment which will appeal to the serious neurological student.

Mescal: The Divine Plant and its Physiological Effects. By HEINRICH KLUVER, Ph.D. Psyche Miniatures, Medical Series. London: Kegan Paul. 1928. Pp. 111. Price 2s. 6d.

THE remarkable properties of mescal (*anhalonium Lewinii*) have been known for many years, and have from time to time been made the subject of pharmacological, clinical, and psychological research. Dr. Kluver presents the reader with a lucid and well-arranged compendium of knowledge in regard to all the aspects of mescal intoxication, paying special attention to the visual hallucinations, the changes in visual imagery, and the apparent distortion or modification of vision for actual objects. The significance of the approach from the experimental side is, of course, very great, for it provides insight into cerebral mechanisms the expression of the activity of which is largely or entirely of the psychical series. Correlation of the more or less definite effects of mescal toxicosis with corresponding phenomena occasionally seen in organic lesions of the posterior parts of the cerebral hemispheres is of unmistakable importance. The visual manifestations are subjected by Dr. Kluver to a painstaking psychological analysis, as are the personality changes which justify the use of the term "mescal psychosis."

This approach from the experimental side seems to us to be full of promise, even if the subjective factor is not to be eliminated in its entirety. Dr. Macdonald Critchley has prefaced the book with a succinct summary of its methods and conclusions.

The bibliography is rather incomplete; in the text various names are mentioned to which no reference is given; and some contributions ought not to have been omitted, especially those of Dixon and of Lewin.

Mirror-Writing. By MACDONALD CRITCHLEY, M.D., M.R.C.P. Psyche Miniatures, Medical Series. London: Kegan Paul. 1928. Pp. 80. Price 2s. 6d.

DR. CRITCHLEY had written a most useful and informative little book on the difficult questions connected with mirror writing and so-called mirror speech. Its value is increased by the insertion of a number of plates reproducing examples of the conditions with which the book deals. Various hypotheses bearing

on these problems are discussed in a brief yet sufficiently critical fashion, and the general conclusion is reached that "handedness" has less to do with mirror-writing than "eyedness"; at the same time, it is admitted that the factors determining this feature of races and individuals are "totally unknown."

Data concerned with inverted writing and with backward speech are cited, and their peculiar interest is fully appreciated by Dr. Critchley, who feels that the details are a rule so meagre and fragmentary that much more investigation and collation of clinical facts must precede hypothesis. He inclines to the view that defective visual perception may be responsible for inverted writing.

Experiments with Handwriting. By ROBERT SAUDEK. London: George Allen and Unwin. 1928. Pp. 395. Price 18s. net.

MR. SAUDEK has devoted years to the study of the minutiæ of the art of graphology, as it seems the subject is now called, and what he does not know of these details is doubtless scarcely worth knowing. He has examined with microscopic eye the infinitely little without losing sight at the same time of calligraphy as a whole, and the reader to whom much of this book's contents may come as a novelty is sure to be impressed, and properly so. But to the neurologist, unfortunately, it is much less likely to be of value. He can learn from it of the influence of intrinsic and extrinsic factors on the end-product, but its examination of neural mechanisms is altogether trifling. The chapter entitled "The central nervous system and the act of writing" has little to do with the central nervous system: and the discussion of "physio-pathological impediments" is equally unsatisfactory.

The collection of varieities of handwriting published in a separate brochure which goes with the book is of some interest.

The Relation of the Skull and Brain to Crime. By W. NORWOOD EAST, M.D., Medical Inspector, H.M. Prisons, England and Wales, etc. Edinburgh and London: Oliver and Boyd, 1928. Pp. 28. Price 6d.

THE Henderson Trust Lectures were founded in 1832 "for the advancement and diffusion of the science of phrenology," and if that "science" is exploded Dr. Norwood East does well to remind us that its founder had other ideas than those of a rigidly phrenological kind. Gall's work embraced much more than cranioscopy. In some respects Gall, Spurzheim, Combe, and others of the group were ahead of their time, especially perhaps in respect of the physiological aspect of criminology. They argued that organs and dispositions correspond, and that if the "organs of the animal propensities" were abnormal and responsible for offences, then mere punishment could never abolish crime. The pendulum has swung far over in that direction to-day, possibly far enough. While it must be accepted as proven that no "criminal type" in a Lombrosan sense exists, the relative value of inherited and acquired causative factors of

crime is not only not ignored, but is constantly stressed. Constitutional failings are blamed, or environmental difficulties and previous events in the offender's life. Admittedly, however, only a percentage of criminals are mentally abnormal. And Dr. East says with sound common sense, "It obscures the issue to exaggerate the importance of declared mental disorder and defect, or the less obvious neuroses, as causative factors of crime. No useful purpose is served by regarding the offender as abnormal merely because he commits crime. Indeed, criminal conduct, like social conduct, is the objective expression of a subjective mental state, and cannot be considered abnormal until all the surrounding circumstances have been reviewed as well as the mental condition of the delinquent."

Methods and Uses of Hypnosis and Self-Hypnosis. By BERNARD HOLLANDER, M.D. London: George Allen & Unwin, Ltd. 1928. Pp. 191. Price 6s.

ACCORDING to the author the hypnosis advocated is only a state of absent-mindedness which will enable the subconscious to break through to the surface. While in this condition, a free talk will reveal the patient's complexes and faults of adaptations. Re-education should follow. His "explanation" of the phenomena of hypnosis here given seems only to be that "the mind of man is largely subconscious and that this subconscious store of ancestral and individual experience, and of inherited instincts and emotions, can be reached by certain procedures. The subconscious mind supplies the stimulus to thought and action." It is denied that there is any mental dissociation in hypnosis, which is only produced "when things are suggested that are not natural to the subject." Far-reaching therapeutic claims are made which we can scarcely regard as valid. We cannot agree with the writer that the contents of this book "should prove of interest and value to the medical and psychological expert." Such readers had much better consult a work where psychotherapeutic principles are dealt with, both theoretically and practically, in a more modern and scientific spirit.

C. S. R.

The Troubled Conscience and the Insane Mind. By CHARLES BLONDEL, Professor of Psychology in the University of Strasburg. Psyche Miniatures, Medical Series. London: Kegan Paul. 1928. Pp. 91. Price 2s. 6d.

IN two essays that are regrettably brief Professor Blondel endeavours to convey to the reader some idea of his views on the functioning of the insane mind. Impressed, like many other clinical observers, with the difficulty of understanding the meaning of the insane patient's complaints in numerous instances, and of the language in which these complaints are couched, the writer is led to consider this unintelligibility, this logical and verbal incoherence, as in

reality " an internal and intimate coherence," which in disease bursts aside the customary bonds of our thought. He is dissatisfied with theories attributing the phenomena to cœnæsthetic disorders, in the sense that such disorders often can be discovered in the absence of mental concomitants, while on the other hand the manner in which any existing cœnæsthetic impairment is experienced still remains to be explained ; this is a question of the mental state of the patient. In regard to the fact of language incoherence, the writer points out that language is a derivative of the " group " to which the individual belongs ; the latter, in order to be understood, must subordinate his individualistic traits to the general concepts of the group. His private experiences—all that reaches his consciousness from the depths of his own organs—can be felt only by himself. Cœnæsthetic experience cannot be compared with that of another ; it is felt " as an indistinct mass underlying clear consciousness and its doings." Consequently, since language is the fruit of collective experience, cœnæsthesia and collective experience contradict one another.

In this fashion does Professor Blondel seek to explain the unintelligibilities of the insane mind ; it is speaking another language than that of normal consciousness ; it is trying to express the unknown in terms of the known ; in a certain sense, it is in rebellion against the conceptual system of the healthy, conscious mind.

Ingenious all this pleading is, and illuminating too ; but there are difficulties, as the writer himself is well aware. Not all insane minds speak an unknown language ; actual, definite disorders of cœnæsthesia do not appear by any means always to bulk largely in the insane consciousness ; the line between sanity and insanity is not to be drawn as sharply as is here done for the sake of argument. In fact, Professor Blondel admits with disarming candour that " it is not in the cœnæsthetic disorders of which we all have experience, but in the way in which they react, that our patients differ from us." To this extent the theory fails to explain the facts it professes to elucidate.

S. A. K. W.

Ueber Technik und Effekte der Sympathikodiaphtherese an den Keimdrüsenarterien. By Dr. KARL DOPPLER, Vienna. Berlin and Vienna ; Urban and Schwarzenberg, 1928. Pp. 40. Price RM 2.

As a result of numerous experiments on animals Dr. Doppler found that it was possible to produce a physiological block in the vasoconstrictors of vessels by painting the exposed artery with a 5-7 per cent. watery solution of phenol. He showed this exercised a neutralising effect on vasoconstrictor fibres without injuring the vessel otherwise. (The solution is on the market under the name of " Isophenal "). In this way all the effects of the Leriche operation (periarterial sympathectomy) can be brought about in unobjectionable fashion, and, according to the writer, in a more intensive degree. By " Sympathicodiaphtheresis " is signified the production of arterial hyperæmia through the removal

of pathological vasoconstriction, and the process has been adopted successfully in cases of arteriosclerotic gangrene, Raynaud syndromes, etc.

In this slender brochure, further experiences with the method in cases of defective function of the glands of internal secretion are fully described. Details of technique are supplied, and difficulties exposed. Dr. Doppler has made the experiment some 250 times, and has never seen any ill results from the carbolic acid. He has worked largely on cases of ovarian and testicular dysfunction, and claims astonishing results; if his contentions are substantiated, the method certainly deserves the fullest clinical trial.

Mongolism: A Study of the Physical and Mental Characteristics of Mongolian Imbeciles. By KATE BROUSSEAU, Professor of Psychology, Mills College, California. Revised by H. G. BRAINERD, M.D, formerly Professor of Neurology and Psychiatry, University of Southern California. London: Baillière, Tindall and Cox. 1928. Pp. 210. Price 20s. net.

A USEFUL monograph of this kind, embodying within its pages information culled from wide sources and enriched by much personal experience of a direct kind, serves at once to illustrate how much is known of the mental and physical traits of the mongolian and how little of their causation. Figures, statistics, minute clinical descriptions, comparative tables and psychological compilations really do little else than by contrast to emphasise the barrenness of the etiological field. Dr. Brousseau summarises her conclusions on causation in eight paragraphs, seven of which are negative! She excludes primitive reversion, parental infection, neuropathic heredity, extreme age of parents at conception, any relation to position in family, mental strain on the part of the pregnant mother, and disease of maternal reproductive organs respectively; and her eighth, and only positive, deduction is, that mongolian imbecility is possibly induced by "some obscure disturbance of the ductless glands." Alas! in the present state of knowledge this is little else than an anticlimax. Yet it may well prove a stimulus; at the least it clears the ground.

The Technique of Psycho-analysis. By EDWARD GLOVER, M.D., Assistant Director, London Clinic of Psycho-analysis. Supplement No. 3 of the International Journal of Psycho-analysis. London: Baillière Tindall and Cox, 1928. Pp. 141. Price 6s. net.

FOR those who practise psycho-analysis a handbook of this kind is indispensable. In a brief preface Dr. Ernest Jones considers it represents "the most comprehensive and one of the most original contributions to the difficult problem of technique in psycho-analysis that have ever been made," which is high praise and surely merited. The student and practitioner of this particular variety of investigation and therapy is taken by regular stages from the opening of psycho-analytic procedures to their termination, and at every point difficulties and uncertainties are faced with the utmost candour and with unmistakable

skill. Throughout, the rigidly practical nature of the study emerges; the matter of fees is mentioned, and the question of whether at the outset the analyst should shake hands or not. The author writes with conviction, and is unusually lucid: and for those who accept the whole theory he is unquestionably impressive. He considers that difficulties incident to the analyst are more important than those relating to the patient, and believes that unconscious bias on the part of the former can be overcome only by his being analysed himself.

The general fairness of the author is maintained all through: only on one occasion, perhaps, has he allowed himself to depart from it, as when he would attribute "gross professional negligence" to the practitioner who does not associate the sequence of "neuritis, amenorrhoea, and divorce" with impotence on the part of the husband. After all, there are many causes of each of these, and their sequence in time is no evidence of their having an identical causation. Further, no "neuritis" in a neurological sense can possibly be "caused" by the impotentia of someone else.

Experimentelle Neurologie (Physiologie und Pathologie des Nervensystems). By E. A. SPIEGEL, Assistant in the Neurological Institute, University of Vienna. First Part. With 69 illustrations. Berlin: S. Karger. 1928. Pp. 281. Price M.24.

THIS textbook of experimental neurology supplies what has been rather a want in neurological literature, viz., a convenient book dealing not merely with neurophysiology in the strict sense but also with experimental neuropathology. That is, the writer provides both a compendium of laboratory neurophysiology and an account of the changes in the nervous system associated with pathological processes, experimental and otherwise. An introductory chapter describing technique is followed by a general exposition of the functions of nerves and nerve-centres and by an examination of the different theories of the biochemical basis of neural activity. The major part of the volume concerns reflex activity in its widest sense; a good description is furnished of the influence of different pathological factors on that activity. Nearly one hundred pages are occupied with the physiology of the vegetative nervous system; its anatomo-physiological features are clearly set forth, and here also the reader is provided with descriptions of its experimental neuropathology Taken as a whole the book is remarkable for its multum-in-parvo character, and will prove as serviceable to the clinical neurologist of scientific mind as to the experimentalist.

Autolycus or the Future of Miscreant Youth. By R. G. GORDON, M.D. London: Kegan Paul, Trench, Trubner & Co., Ltd. 1928. Pp. 94. Price 2s. 6d.

AN excellent little volume on juvenile delinquency. After chapters on the conceptions of crime and punishment, the delinquent personality is dealt with and the social, educational, psychological, and medical factors are discussed. The future aims in prevention and treatment are clearly set out in conclusion.

The subject is very interestingly reviewed in its various modern aspects without any unnecessary details. As a comprehensive survey of an important social problem, simply and yet scientifically handled, the contents of these pages can be most thoroughly recommended.

C. S. R.

Twins and Orphans : The Inheritance of Intelligence. By ALEX. H. WINGFIELD, B.A., Ph.D. London and Toronto : J. M. Dent and Sons. 1928. Pp. 127. Price 10s. 6d.

DR. WINGFIELD set himself the problem of attempting a differentiation between environmental and hereditary characteristics. Ambitious and possibly unrealisable as this may seem to some, his approach is ingenious and capable of imparting much useful information. Such questions as the following are posited : (1) How great is the resemblance in mental traits among children of the same parents or ancestry ? (2) What part of the future adult is really determined by the school as an agency of his environment and what part is beyond the control of the school ? (3) Does education affect only the generation to which it is given, and if so, why ?

For his immediate purposes, he has studied groups of fraternal and identical twins on the one hand, and, on the other, groups of orphans reared for a certain proportion of their lives in a fairly constant environment. The research has been conducted in a scientific spirit. Among the conclusions we note that twins are no more alike in these traits upon which the school has concentrated its training than in general intelligence ; environment is inadequate to account for the mental resemblances of twins. Like-sex pairs of twins show a greater degree of resemblance in intelligence than unlike-sex pairs. Moreover, physically identical pairs show a higher degree of mental resemblance than fraternal pairs. Orphan children, who have been reared together for a considerable portion of their lives, are no more alike than unrelated children paired at random, either in general intelligence or in other intellectual traits.

The significance of these generalisations is distinctly impressive.

Three Lectures on Neurobiotaxis and other Subjects. Delivered at the University of Copenhagen. By C. U. ARIENS KAPPERS, Amsterdam. London : William Heinemann (Medical Books), Ltd. 1928. Pp. 76. Price 7s. 6d.

THE first lecture epitomizes the views of the distinguished author of this brochure on the " psychical " law in the structure of the nervous system which has been termed neurobiotaxis. In the second the phylogeny and ontogeny of the corpus striatum are summarised, the descriptions being based largely on comparative anatomy. The differences in the striatal complex of various animal levels are well illustrated, and it is regarded as doubtful whether its actual highest development is in man : compared with the brainstem its size is larger in some of the lower mammals. Kappers states there are some connexions between the neopallium and the neostriatum, " but only few." The development of the cortex and the functions of its different layers is the subject of the

third lecture. Among general conclusions, we note that supragranular layers develop pari passu with corticipetal and association fibres; in the higher animals their cells increase much more than those of any other layer; and in this respect there is an analogy with striatum and cerebellum, in which organs a similar increase of "receptive correlative cells" is found, in comparison with "effectory parts."

The Opium Problem. By CHARLES R. TERRY, M.D., and MILDRED PELLENS. New York: Published for the Committee on Drug Addictions. 1928. Pp. 1042.

FOR the first time there has been brought into one volume a selection from an enormous bibliography of contributions to every conceivable aspect of the problems furnished by drug addiction. More than one thousand closely printed pages, dealing with etiology, symptomatology, pathology, treatment, and not omitting more general sociological considerations, such as international, national, state, and municipal control—here is a mine of solid information in which the student may dig to his heart's content. From the more purely medical and neurological standpoint the chapters on pathology and semiology will repay perusal; they are exceptionally interesting and informative. In this country we believe it to be a matter of general experience that cases of drug-taking are on the decrease, due no doubt in part to diminishing facilities, but not by any means exclusively so. Nevertheless cases of this kind still occur and demand special skill and knowledge on the part of those who handle them. The chapter on treatment contains a precis of the best methods in vogue, and it too will remunerate its reader.

With the wider questions of control and suppression we are individually less concerned; but the first step towards these desirable ends is constituted by complete exposure of the facts, and this task the Committee on Drug Addiction has performed admirably.

A Classification of Neurological, Psychiatric, and Endocrine Disorders. New York: American Neurological Association. 1928. Pp. 48.

THE Committee of the American Neurological Association appointed to furnish this classification of diseases, or rather disorders, were faced with an onerous task, but they have acquitted themselves very well indeed. Criticism must be confined to one or two points. In the index cervical rib is not mentioned, nor is Parkinson's disease (a surprising omission, since it is given in the text on p. 23); meralgia paræsthetica is misprinted "meralga" more than once. Both psychoneuroses and paroxysmal disorders are omitted from the index, but are referred to throughout the text. Degenerative tic (Gilles de la Tourette's disease) is included in the group of degeneration and sclerosis of combined grey and white matter, yet it is far from being so definitely structural as the amyotrophic lateral sclerosis and Friedreich's disease put on either side of it. Under progressive muscular dystrophy the Buzzard type, the distal type, and Erb's juvenile type might have found a place.

These are minor details. The book itself represents a courageous attempt to introduce systematisation into a confusing subject.